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(54)【発明の名称】　情報信号伝送装置

(57)【要約】

【課題】ネットワークを形成して所望の情報信号を送受する情報信号伝送装置において、機器の設置作業を簡略化する。

【解決手段】本発明は、各機器間で、各機器の属性を示す情報と機器アドレスを送受し、この属性情報に基づいて接続可能か否か判定し、この判定結果に基づいて機器間を接続する。

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【特許請求の範囲】

【請求項１】ネットワークを形成して所望の情報信号を送受する情報信号伝送装置において、

前記ネットワーク上の他の機器に対して、装置の属性を示す属性情報と、ネットワーク上における装置のアドレスを示す機器アドレスとを送出する識別情報送出手段と、

前記他の機器より、前記他の機器の属性情報と、前記他の機器の機器アドレスとを取得する識別情報取得手段と、

前記取得した属性情報に従って、前記取得した情報信号の機器と接続可能か否か判定する判定手段とを備えることを特徴とする情報信号伝送装置。

【請求項２】前記判定手段は、

前記取得した属性情報と、前記識別情報送出手段より送出する属性情報との比較結果に基づいて、接続可能か否か判定することを特徴とする請求項１に記載の情報信号伝送装置。

【請求項３】前記判定手段は、

取得した機器アドレスを基準にして、前記他の機器間で、接続の順位を設定する接続順位設定手段を有し、

前記接続の順位に従って前記情報信号を送出し、又は前記情報信号を入力することを特徴とする請求項１に記載の情報信号伝送装置。

【請求項４】操作子の操作に応動して、前記他の機器間で接続の順位を設定する接続順位設定手段を有し、

前記接続の順位に従って前記情報信号を送出し、又は前記情報信号を入力することを特徴とする請求項１に記載の情報信号伝送装置。

【請求項５】１の遠隔制御手段により制御可能な機器間を基準にして、前記他の機器間で接続の順位を設定する接続順位設定手段を有し、

前記接続の順位に従って前記情報信号を送出し、又は前記情報信号を入力することを特徴とする請求項１に記載の情報信号伝送装置。

【請求項６】前記属性情報は、

機器の機種の情報を含んでなることを特徴とする請求項１に記載の情報信号伝送装置。

【請求項７】前記属性情報は、

前記ネットワーク上に送出可能な前記情報信号の形式の情報、又は前記ネットワーク上で受信可能な前記情報信号の形式の情報を含んでなることを特徴とする請求項１に記載の情報信号伝送装置。

【請求項８】前記識別情報送出手段は、

前記他の機器からの要求に応動して、前記識別情報及び前記属性情報を送出することを特徴とする請求項１に記載の情報信号伝送装置。

【請求項９】前記識別情報送出手段は、

前記他の機器からの要求に応動して、前記他の機器に対して接続可能か否か判定し、判定結果に基づいて前記識

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別情報及び前記属性情報を送出することを特徴とする請求項１に記載の情報信号伝送装置。

【請求項１０】前記識別情報取得手段は、

前記他の機器に対して前記属性情報及び機器アドレスの送出を要求して、前記属性情報及び機器アドレスを取得することを特徴とする請求項１に記載の情報信号伝送装置。

【請求項１１】前記識別情報取得手段は、

前記他の機器の前記ネットワークへの配置を検出すると、前記属性情報及び機器アドレスの送出を要求することを特徴とする請求項８に記載の情報信号伝送装置。

【請求項１２】前記識別情報取得手段は、

前記ネットワークへ配置されると、前記属性情報及び機器アドレスの送出を要求することを特徴とする請求項８に記載の情報信号伝送装置。

【請求項１３】前記識別情報取得手段は、

前記他の機器に対して前記属性情報及び機器アドレスの送出を要求して、前記属性情報及び機器アドレスを取得することができない場合、所定の警告を発生することを特徴とする請求項１に記載の情報信号伝送装置。

【請求項１４】接続の求められる種類の機器との間で接続不可能な判定結果が得られた場合、所定の警告を発生する報知手段を有することを特徴とする請求項１に記載の情報信号伝送装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、情報信号伝送装置に関し、例えばＩＥＥＥ（The Institute of Electrical and Electoronics Engineers,Inc.）１３９４でビデオ機器を接続する場合に適用することができる。本発明は、各機器間で、各機器の属性を示す情報と機器アドレスを送受し、この属性情報に基づいて接続可能か否か判定することにより、機器の設置作業を簡略化する。

【０００２】

【従来の技術】従来、各種のビデオ機器は、テレビジョンチュナー、モニタ装置、光ディスク装置等を接続してＡＶシステムを構成する場合、例えばこの種のビデオ機器の最終的な出力装置でなる表示装置等を中心に各ビデオ機器を専用線で接続してシステムを構成するようになされている。

【０００３】すなわちこのようなビデオ機器によりＡＶシステムを構成する場合、テレビジョンチュナー、光ディスク装置等のビデオソースは、何れの場合でも、最終的な出力対象でなるモニタ装置にビデオ信号及びオーディオ信号を出力することになる。これによりこの種のシステムでは、モニタ装置に複数のビデオ入力端子、オーディオ入力端子を配置し、これらビデオ入力端子及びオーディオ入力端子に各ビデオソースよりビデオ信号及びオーディオ信号を入力する。

【０００４】また光ディスク装置等の記録機能を有する

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ビデオ機器に対しては、モニタ装置の外部出力端子を介
して、又は直接に、チューナー等のビデオソースを接続し
てビデオ信号及びオーディオ信号を入力する。このよう
な接続において、ビデオ機器は、シールド線、同軸ケー
ブルを用いてビデオ信号、オーディオ信号を伝送し、こ
れによりノイズ等の混入を低減できるようになされてい
る。

【０００５】これに対してディジタル信号によりビデオ
信号を処理するようになされたカメラ一体型のビデオテ
ープレコーダ等においては、例えばＩＥＥＥ１３９４に
規定のインターフェースによりビデオ信号及びオーディ
オ信号を入出力できるようになされている。

【０００６】
【発明が解決しようとする課題】ところでこのようなＩ
ＥＥＥ１３９４のインターフェースは、１つのバスを時
分割により複数の機器で使用することにより、リング状
に、又はスター状に機器を接続してネットワークを構成
することができ、これにより簡易にビデオ機器を接続で
きると考えられる。

【０００７】ところがＩＥＥＥ１３９４のインターフェ
ースは、何れの機器との間でビデオ信号及びオーディオ
信号を入出力するかは、システム全体の動作を管理する
親機により管理されることにより、結局、機器間のケー
ブル接続については簡略化できるものの、この親機に対
して機器の接続関係を設定する必要がある。すなわちケ
ーブルの接続作業自体は簡略化できるものの、この接続
作業に付随する機器関係の設定が煩雑になり、結局、機
器の設置作業が煩雑な問題があった。

【０００８】本発明は以上の点を考慮してなされたもの
で、ネットワークにより機器を接続して所望の情報信号
を送受する際に、機器の設置作業を簡略化することがで
きる情報信号伝送装置を提案しようとするものである。

【０００９】
【課題を解決するための手段】かかる課題を解決するた
め本発明においては、ネットワーク上の他の機器に対し
て、装置の属性を示す属性情報と、ネットワーク上にお
ける装置のアドレスを示す機器アドレスとを送出する一
方で、他の機器より属性情報及び機器アドレスとを取得
し、この取得した属性情報に従って接続可能か否か判定
する。

【００１０】ネットワーク上における他の機器の属性情
報によれば、この他の機器に対して接続可能か判定する
ことができる。またこの他の機器の機器アドレスを基準
にして所望の情報信号を送受することができる。また他
の機器に対しても属性情報及び機器アドレスを送出すれ
ば、この他の機器においても同様に、簡易に接続可能か
否か判定して、所望の情報信号を入出力することができ
る。これらのことからネットワーク上に種々の機器が配
置される場合でも、簡易に接続関係をネットワーク上で
把握して、データ通信することができる。

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【００１１】
【発明の実施の形態】以下、適宜図面を参照しながら本
発明の実施の形態を詳述する。

【００１２】（１）第１の実施の形態
図１は、本発明の実施の形態に係るＡＶシステムを示す
ブロック図である。このＡＶシステム１は、チューナー２
Ａ及び２Ｂ、モニタ装置３をＩＥＥＥ１３９４に規定さ
れたバスＢＵＳにより接続し、これらチューナー２Ａ及び
２Ｂ、モニタ装置３によりネットワークを形成する。さ
らにＡＶシステム１は、リモートコマンダ４の操作によ
り、又は各機器の直接の操作により動作を切り換え、チ
ューナー２Ａ又は２Ｂで受信したビデオ信号及びオーディ
オ信号をモニタ装置３でモニタする。

【００１３】ここでチューナー２Ａ及び２Ｂは、同一の構
成でなることにより、チューナー２Ａについてのみ構成を
説明し、チューナー２Ｂについては重複した説明は省略す
る。このチューナー２Ａにおいて、受信部７Ａは、制御部
８Ａにより制御されて動作を切り換え、ユーザーの選曲
したテレビジョン放送信号をアンテナ９Ａより選択的に
入力し、この入力したテレビジョン放送信号よりビデオ
信号及びオーディオ信号を復調する。

【００１４】番組出力部１０Ａは、この受信部７Ａで復
調されたビデオ信号及びオーディオ信号を受け、このビ
デオ信号及びオーディオ信号を所定フォーマットにより
符号化処理する。さらに番組出力部１０Ａは、ネットワ
ークインターフェース（ネットワークＩＦ）１１Ａから
の要求に応じて、この符号化処理したビデオ信号及びオ
ーディオ信号ＤＡを所定のタイミングでネットワークイ
ンターフェース１１Ａに出力する。これによりチューナー
２Ａは、このネットワークインターフェース１１Ａを介
して、受信したビデオ信号及びオーディオ信号ＤＡをＩ
ＥＥＥ１３９４に規定されたバスＢＵＳに出力する。

【００１５】すなわちネットワークインターフェース１
１Ａは、このＩＥＥＥ１３９４に規定された通信処理を
実行する入出力回路により構成され、このチューナー２Ａ
がバスＢＵＳに接続された後、アイドリング状態に立ち
上げられると、このバスＢＵＳに接続された各機器のネ
ットワークインターフェース１１Ｂ等と所定の通信処理
を実行し、これによりチューナー２Ａの機器アドレスＡＡ
を取得する。

【００１６】ここでこの機器アドレスＡＡは、ブリッジ
により接続した各バスを識別するバスアドレスと、各バ
ス上におけるノードアドレスにより構成され、他のビデ
オ機器と重複したアドレスが設定されないようになされ
ている。かくするにつき、このネットワークにおいて
は、ブリッジによりバスを接続して、バス間でビデオ信
号及びオーディオ信号を送受できるように構成され、こ
のためこの各バスを識別するバスアドレスが設定される
ようになされている。

【００１７】ネットワークインターフェース１１Ａは、

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他のビデオ機器との間の通信により未だ他のビデオ機器に割り当てられていない機器アドレスＡＡを取得し、この取得した機器アドレスＡＡをアドレスメモリ１２Ａに保持すると共に、この機器アドレスＡＡを基準にしてこのネットワークを形成する他のビデオ機器と種々の情報を送受するようになされている。

【０００１８】なおネットワークインターフェース１１Ａは、バスＢＵＳの状態を監視し、例えば何れかの機器がバスＢＵＳより切り離されると、この状態を検出する。さらにこの検出結果に基づいて、改めて機器アドレスＡＡの検出処理を実行する。

【００１９】ネットワークインターフェース１１Ａは、チューナ２Ａがアイドリングの状態に保持された状態で、この取得した機器アドレスを基準にしてバスＢＵＳを監視し、自己の機器を指定するパケットデータがバスＢＵＳ上に送出されると、このパケットのデータを取り込んで制御部８Ａに出力する。これによりチューナ２Ａでは、例えばリモートコマンダ４の操作に応動してモニタ装置３より出力される制御コマンドを取り込み、制御部８Ａによりチューナ２Ａの電源を立ち上げるようになされている。

【００２０】またこのようにして電源が立ち上げられると、又はチューナ２Ａの直接の操作により電源が立ち上げられると、ネットワークインターフェース１１Ａは、制御部８ＡからのリクエストによりバスＢＵＳに占有の要求を出力し、この要求に応じて他の機器より占有の許可が得られると、属性情報出力部１３Ａより出力される属性情報ＢＡ、アドレスメモリ１２Ａに記録された機器アドレスＡＡをバスＢＵＳに出力する。

【００２１】ここで属性情報出力部１３Ａは、属性情報ＢＡを保持し、制御部８Ａの制御により、ネットワークインターフェース１１Ａを介してこの属性情報ＢＡを出力する。ここで属性情報ＢＡは、各機器の属性を示す情報により構成され、チューナ２Ａの場合、このチューナ２Ａのメーカー名、機器の種別（チューナ、モニタ装置等の種別でなる）を示す分類コード、出力データの形式（ＭＰＥＧ２、ＭＰＥＧ４、ディジタルオーディオインターフェース等でなる）により構成される。これによりネットワークインターフェース１１Ａは、動作可能状態に立ち上がると、このシステム１全体の動作を制御する親機に対して、その旨を通知し、また制御に必要な情報を通知する。

【００２２】さらにネットワークインターフェース１１Ａは、このようにして動作可能な状態になった後、自己の機器を指定するパケットデータがバスＢＵＳ上に送出されると、このパケットのデータを取り込んで制御部８Ａに出力する。これによりチューナ２Ａでは、例えばリモートコマンダ４の操作に応動してモニタ装置３より動作の開始が指示されると、番組出力部１０Ａよりビデオ信号及びオーディオ信号ＤＡを受け、このビデオ信号及

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びオーディオ信号を所定のブロック単位でバスＢＵＳに出力する。このときネットワークインターフェース１１Ａは、制御部８Ａにより指定される機器アドレスを付加して、パケットによりビデオ信号及びオーディオ信号を出力する。

【００２３】かくするにつき、この制御部８Ａにより指定される機器アドレスは、このシステム１を制御する親機により指定され、パケットのデータを取り込んで制御部８Ａに出力することにより、動作開始の制御コマンドと共に制御部８Ａに取得される。

【００２４】すなわちこのシステム１においては、パケット通信により種々のデータを送受するようになされており、各パケットは、図２に示すように、先頭領域より、各パケットを示すヘッダデータと、このヘッダデータの誤り訂正符号が配置される。さらにデータフィールドのヘッダが配置された後、データフィールドが配置され、続いてこのデータフィールドの誤り訂正符号が配置される。各パケットは、各機器にビデオ信号、オーディオ信号、制御コマンド等を送出する場合、さらには機器アドレスを取得する場合、これらのビデオ信号、オーディオ信号、制御コマンド等がデータフィールドに割り当てられ、送信先の機器アドレスがデータフィールドのヘッダに設定される。

【００２５】かくするにつきネットワークインターフェース１１Ａは、このデータフィールドのヘッダに設定された機器アドレスを監視して、チューナ２Ａを指定するパケットを取り込んだ後、データフィールドに割り当てられたデータを誤り訂正処理して制御部８Ａに出力する。これによりネットワークインターフェース１１Ａは、このデータフィールドに割り当てられたデータにより制御部８Ａに制御コマンド、送出先の機器アドレス等を通知する。またビデオ信号及びオーディオ信号をこのデータフィールドに割り当てると共に、データフィールドのヘッダに送出先の機器アドレスを設定する。

【００２６】制御部８Ａは、このチューナ２Ａの動作を制御するコンピュータにより構成され、図示しない操作子の操作に応動して、またネットワークインターフェース１１Ａを介して入力される制御コマンドに応動して全体の動作を切り換え制御し、これにより所望のテレビジョン放送を受信して、受信結果でなるビデオ信号及びオーディオ信号をバスＢＵＳに出力する。

【００２７】さらに制御部８Ａは、直接の操作により電源が立ち上げられると、ネットワークインターフェース１１Ａを制御して、バスＢＵＳ上の全機器に対してチューナ２Ａの機器アドレス及び属性情報を送出する。なおこの制御部８Ａを構成するコンピュータは、同時に、属性情報出力部１３Ａをも構成する。

【００２８】チューナ２Ｂは、チューナ２Ａと同様にして、機器アドレスＡＢを取得し、バスＢＵＳに属性情報ＢＢ、機器アドレスＡＢ、ビデオ信号及びオーディオ信

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号ＤＢを出力する。

【００２９】モニタ装置３は、このＡＶシステム１全体の動作を制御する親機を構成する。すなわちモニタ装置３において、表示部１５は、制御部１６により制御されて動作を切り換え、映像入力部１７より入力されるビデオ信号を表示し、また同様に映像入力部１７より入力されるオーディオ信号を出力する。映像入力部１７は、制御部１６により制御されて動作を切り換え、ネットワークインターフェース１８を介してバスＢＵＳよりビデオ信号及びオーディオ信号を入力する。さらに映像入力部１７は、この入力したビデオ信号及びオーディオ信号を復号して表示部１５に出力する。これによりモニタ装置３は、チューナ２Ａ及び２Ｂで受信した番組を試聴できるようになされている。

【００３０】アドレスメモリ１２Ｃは、ネットワークインターフェース１８を介して取得されるモニタ装置３の機器アドレスＡＣを保持する。ネットワークインターフェース１８は、チューナ２Ａ及び２Ｂのネットワークインターフェース１１Ａ及び１１Ｂと同様に、このモニタ装置３がバスＢＵＳに接続された後、アイドリング状態に立ち上げられると、モニタ装置３の機器アドレスＡＣを取得する。

【００３１】さらにネットワークインターフェース１８は、モニタ装置３がアイドリングの状態に保持された状態で、この取得した機器アドレスＡＣを基準にしてバスＢＵＳを監視し、自己の機器を指定するパケットがバスＢＵＳ上に送出されると、このパケットのデータを取り込んで制御部１６に出力する。これによりモニタ装置３では、例えば他の親機より出力される制御コマンドを取り込んで、制御部１６により電源を立ち上げるようになされている。

【００３２】またこのようにして電源が立ち上げられると、又は直接の操作、リモートコマンダ４の操作により電源が立ち上げられると、ネットワークインターフェース１８は、制御部１６からのリクエストによりバスＢＵＳに占有の要求を出力し、この要求に応じて占有の許可が得られると、属性情報出力部１９より出力される属性情報ＢＣをバスＢＵＳに出力する。

【００３３】このモニタ装置３における属性情報出力部１９は、このモニタ装置３の属性を示す属性情報を出力し、この属性情報は、このモニタ装置３のメーカー名、機器の種別を示す分類コード、入力データの形式により構成される。これによりネットワークインターフェース１８は、動作可能状態に立ち上がると、このシステム全体の動作を制御する他の親機に対して、その旨を通知し、また制御に必要な情報を通知する。これによりこのＡＶシステム１においては、１つのネットワークに複数台の親機を設置できるようになされている。なおこのＡＶシステム１は、このモニタ装置３だけが親機としての機能を有するようになされており、これにより属性情報

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出力部１９は、この実施の形態においては、起動時、無駄な処理手順を実行することになる。

【００３４】さらにネットワークインターフェース１８は、このようにしてアイドリングの状態から立ち上がった後、自己の機器を指定するパケットがバスＢＵＳ上に送出されると、このパケットのデータを取り込んで制御部１６に出力する。これによりモニタ装置３では、例えば他の親機からの制御によりバスＢＵＳよりビデオ信号及びオーディオ信号を入力し、このビデオ信号及びオーディオ信号を映像入力部１７に出力する。これによりモニタ装置３は、他の親機の操作によってもバスＢＵＳに出力されるビデオ信号等をモニタできるようになされている。

【００３５】ネットワークインターフェース１８は、このように子機でなるチューナ２Ａ等のネットワークインターフェース１１Ａとほぼ同様な動作に加えて、送信先アドレスをデフォルト値に設定したパケットがバスＢＵＳ上に送出されると、このパケットのデータを入力する。これによりモニタ装置３は、このＡＶシステム１の制御に必要な各子機の属性情報、機器アドレスを取得する。

【００３６】さらにネットワークインターフェース１８は、この入力したパケットのデータを接続制御部２０に出力し、これに応動して接続制御部２０から出力される所定のデータをバスＢＵＳに出力する。またこのデータの送出に応動して各子機より得られるパケットを受信し、そのデータフィールドに割り当てられたデータを接続制御部２０に出力する。

【００３７】これによりモニタ装置３は、取得した各子機の属性情報及び機器アドレス、さらには自己の属性情報、機器アドレスに基づいて、全体の接続関係を把握するようになされ、さらにはこの接続関係に基づいて全体の動作を制御するようになされている。

【００３８】またネットワークインターフェース１８は、子機のネットワークインターフェース１１Ａと同様に、何れかの機器がバスＢＵＳより切り離されると、機器アドレスを再検出し、接続制御部２０に通知する。これによりモニタ装置３は、機器の接続が変更された場合に、改めて制御に必要な各子機の属性情報、機器アドレスを取得し直すようになされている。

【００３９】制御部１６は、このモニタ装置３の動作を制御するコンピュータにより構成され、図示しない操作子の操作に応動して、またネットワークインターフェース１８を介して入力される制御コマンド、リモコン受信部２１、接続制御部２０を介して入力されるリモートコマンダの操作に応動して全体の動作を切り換え制御すると共に、必要に応じて接続制御部２０との間でデータ通信する。これによりモニタ装置３ではバスＢＵＳを介して入力されるビデオ信号及びオーディオ信号をモニタできるようになされている。なおこの制御部１６を構成す

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るコンピュータは、同時に、属性情報出力部１９、接続制御部２０をも構成する。

【００４０】リモコン受信部２１は、リモートコマンダ４より出力される遠隔制御信号を受信して接続制御部２０に出力する。接続制御部２０は、このリモコン受信部２１からの出力信号、ネットワークインターフェース１８を介して検出される制御コマンドに応動して、さらには制御部１６を介して検出されるモニタ装置３の直接の操作に応動して、このＡＶシステム１の接続を制御する。

【００４１】このとき接続制御部２０は、バスＢＵＳに接続された機器より機器アドレス及び属性情報が送出されると、ネットワークインターフェース１８を介して、この機器アドレス及び属性情報を順次取り込む。さらにこの取り込んだ機器アドレス及び属性情報により、機器リストメモリ２２及び接続可能リストメモリ２３にそれぞれ機器リスト及び接続可能リストを更新し、この作成したリストに従ってＡＶシステム１全体の動作を制御する。

【００４２】すなわち機器リストメモリ２２は、このバスＢＵＳを介して検出される各機器の機器アドレスと属性情報をリスト化してなる機器リストを記憶する。これによりモニタ装置３は、この機器リストに従って、単にバスＢＵＳを接続しただけの簡易な作業によっても、バスＢＵＳに接続された各機器間の関係を把握できるようになされている。

【００４３】これに対して接続可能リストメモリ２３は、接続可能リストを保持し、この接続可能リストは、この機器リストの属性情報、モニタ装置３の属性情報を順次比較して得られる、接続可能な機器を順次リスト化して作成される。これにより接続制御部２０は、例えばユーザーがリモートコマンダ４を操作して選択可能なソースの表示を指定すると、この接続可能リストに従って、各子機の情報を表示部１５に表示する。またこの表示に従ってユーザーがリモートコマンダ４を操作すると、ネットワークインターフェース１８を介して、接続可能リスト及び接続リストに従って、送信先の機器アドレス、制御コマンドをデータフィールドに割り当てて、この機器アドレス及び制御コマンドをユーザーの選択した機器に送出する。

【００４４】これにより接続制御部２０は、未だ機器リスト及び接続可能リストが作成されていない状態で、例えばチュナー２Ａの電源が立ち上げられた場合は、図３に示す処理手順を実行して、チュナー２Ａで受信したビデオ信号及びオーディオ信号をモニタ装置３によりモニタする。

【００４５】すなわちチュナー２Ａにおいて、ステップＳＰ１からステップＳＰ２に移り、ここでユーザーの直接の操作によりチュナー２Ａの電源が立ち上げられると、続くステップＳＰ３において、チュナー２Ａのネッ

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トワークインターフェース１１Ａよりチュナー２Ａの機器アドレスと属性情報とがバスＢＵＳに送出される。

【００４６】この送出された属性情報、機器アドレスは、親機に設定されてなるモニタ装置３のネットワークインターフェース１８において受信されることになる。すなわちモニタ装置３において、接続制御部２０は、ステップＳＰ４からステップＳＰ５に移り、ここでこのバスＢＵＳに送出されたチュナー２Ａの機器アドレスと属性情報とをネットワークインターフェース１８を介して受信する。さらに接続制御部２０は、続くステップＳＰ６において機器リストメモリ２２の機器リストにこの機器アドレス及び属性情報を付加して機器リストを生成する。

【００４７】続いて接続制御部２０は、ステップＳＰ７に移り、このチュナー２Ａの属性情報に割り当てられた出力データの形式より、このチュナー２Ａを何れの機器に接続可能か否か判定する。ここでモニタ装置３の属性情報よりモニタ装置３に対して接続可能と判定されると、接続制御部２０は、ステップＳＰ８に移り、チュナー２Ａの接続可能機器をモニタ装置３に、またモニタ装置３の接続可能機器にチュナー２Ａを記録し、これにより接続可能リストを更新する。

【００４８】続いて接続制御部２０は、ステップＳＰ９に移り、この場合チュナー２Ａを直接操作してユーザーが電源を立ち上げたことにより、チュナー２Ａの接続可能機器でなるモニタ装置３の電源を立ち上げる。すなわち接続制御部２０は、制御部１６との間のデータ通信により、このモニタ装置３の電源を立ち上げる。続いて接続制御部２０は、ステップＳＰ１０に移り、チュナー２Ａに対して、送信先アドレスをモニタ装置３に設定し、かつビデオ信号及びオーディオ信号の送信開始を指示する制御コマンドを発行する。

【００４９】この送信先アドレス及び制御コマンドは、ステップＳＰ１１において、バスＢＵＳを監視するチュナー２Ａのネットワークインターフェース１１Ａにより取得され、この取得した送信先アドレス及び制御コマンドがチュナー２Ａの制御部８Ａに入力される。これによりチュナー２Ａにおいては、制御部８Ａにより全体の動作が制御されて、続くステップＳＰ１２よりビデオ信号及びオーディオ信号をデータフィールドに割り当てて、かつモニタ装置３の機器アドレスを指定して、ビデオ信号及びオーディオ信号の送信を開始する。

【００５０】これによりバスＢＵＳを監視するモニタ装置３のネットワークインターフェース１８によりビデオ信号及びオーディオ信号を割り当てたパケットが受信され、モニタ装置３では続くステップＳＰ１３において、このチュナー２Ａより送出されたビデオ信号及びオーディオ信号の受信を開始した後、ステップＳＰ１４に移ってこの処理手順を終了する。またチュナー２Ａにおいても、ビデオ信号及びオーディオ信号の送信を開始する

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と、ステップＳＰ１５に移ってこの処理手順を終了し、続く操作を待ち受けることになる。なおチューナ２Ｂにおいては、この処理手順においては、何ら制御に関係することなく、ステップＳＰ１６からステップＳＰ１７に移って続く操作を待ち受けることになる。

【００５１】この状態で、モニタ装置３及びチューナ２Ａの電源が遮断された後、モニタ装置３の電源が立ち上げられると、接続制御部２０は、図４に示す処理手順を実行して全体の動作を制御する。

【００５２】すなわち直接の操作により、又はリモートコマンダの操作によりモニタ装置３の電源が操作されると、モニタ装置３は、ステップＳＰ２０からステップＳＰ２１に移り、制御部１６により電源が立ち上げられる。続いてステップＳＰ２２に移り、接続制御部２０は、接続可能リストよりモニタ装置３に接続可能な機器を選択する。この場合、接続可能リストにおいて、モニタ装置３に接続可能な機器としてチューナ２Ａが登録されていることにより、接続制御部２０は、接続対象の機器にチューナ２Ａを選択し、チューナ２Ａに向けて、送信先アドレスをモニタ装置３に設定し、かつビデオ信号及びオーディオ信号の送信開始を指示する制御コマンドを発行する。

【００５３】チューナ２Ａは、ステップＳＰ２３からステップＳＰ２４に移り、ネットワークインターフェース１１Ａを介して、この送信先アドレス及び制御コマンドを取得する。さらにチューナ２Ａは、制御部８Ａの制御により、この取得した送信先アドレス及び制御コマンドに従って電源を立ち上げ、続くステップＳＰ２６よりモニタ装置３の機器アドレスを指定して、ビデオ信号及びオーディオ信号の送信を開始する。

【００５４】これによりバスＢＵＳを監視するモニタ装置３のネットワークインターフェース１８において、ビデオ信号及びオーディオ信号を割り当てたパケットが受信され、モニタ装置３では続くステップＳＰ２７において、このチューナ２Ａより送出されたビデオ信号及びオーディオ信号の受信を開始した後、ステップＳＰ２８に移ってこの処理手順を終了する。またチューナ２Ａにおいても、ビデオ信号及びオーディオ信号の送信を開始すると、ステップＳＰ２９に移ってこの処理手順を終了し、続く操作を待ち受けることになる。なおこの場合も、チューナ２Ｂにおいては、この処理手順においては、何ら制御に関係することなく、ステップＳＰ３０からステップＳＰ３１に移って続く操作を待ち受けることになる。

【００５５】なお接続制御部２０は、ネットワークインターフェース１８により、バスＢＵＳの接続の変更が検出されて、各機器アドレスが再設定されると、これに応動して機器リスト及び接続可能リストをイニシャライズする。

【００５６】以上の構成において、ＡＶシステム１にお

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いては（図１）、バスＢＵＳにチューナ２Ａ等の機器が接続されてアイドリングの電源が立ち上げられると、この接続された機器のネットワークインターフェース１１Ａ、１１Ｂ、１８により、バスＢＵＳに接続された各機器の機器アドレスが問い合わされ、バスＢＵＳに未設定の機器アドレスＡＡ、ＡＢ、ＡＣが各機器に設定される。

【００５７】またこのネットワークインターフェース１１Ａ、１１Ｂ、１８により、バスＢＵＳの状態が監視され、バスＢＵＳの接続が変更されると、同様にして、機器アドレスＡＡ、ＡＢ、ＡＣが再設定される。

【００５８】このようにして機器アドレスＡＡ、ＡＢ、ＡＣが設定された状態で、子機でなるチューナ２Ａ等の電源が立ち上げられると、送信先アドレスをデフォルト値に設定して、この子機の機器アドレスＡＡ、ＡＢと属性情報ＢＡ、ＢＢとがバスＢＵＳに送出され、この機器アドレスＡＡ、ＡＢと属性情報ＢＡ、ＢＢとが親機３により取得される。これにより親機３において、機器アドレスＡＡ、ＡＢと属性情報ＢＡ、ＢＢとをリスト化してこのバスＢＵＳに接続された機器リストが作成される。

【００５９】さらにこの機器リストに保持された属性情報、モニタ装置３の属性情報の間で順次比較結果が得られ、この比較結果に基づいて接続可能な機器関係をリスト化した接続可能リストが作成される。これによりＡＶシステム１では、単にバスＢＵＳを接続するだけの簡易な接続作業によっても、親機において、各機器の接続関係が把握され、この把握された接続関係に従って各機器の動作が制御される。

【００６０】すなわちユーザーの操作により、チューナ２Ａが選択されて電源が立ち上げられると、このチューナ２Ａに接続可能な機器（モニタ装置３）が接続可能リストより選択され、この選択された機器３にビデオ信号及びオーディオ信号を送信するようにチューナ２Ａが制御され、これによりチューナ２Ａで受信した番組がモニタ装置３によりモニタできるように設定される。

【００６１】またモニタ装置３の電源が立ち上げられると、このモニタ装置３に接続可能な機器（チューナ２Ａ又は２Ｂ）が接続可能リストより選択され、モニタ装置３に向けてビデオ信号及びオーディオ信号を送信するように、この選択された機器２Ａが制御され、これによりチューナ２Ａで受信した番組がモニタ装置３によりモニタできるように設定される。

【００６２】さらにこのようにして全体の動作を制御するモニタ装置３においても、電源が立ち上げられると、他の機器に対して属性情報及び機器アドレスを送出することにより、このネットワークに他の親機が配置されている場合には、この他の親機において機器リスト及び接続可能リストを作成することができる。

【００６３】これによりユーザーの要望に応じて、チューナ、ビデオテープレコーダ、パーソナルコンピュータ

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等の種々の機器が接続される、一般のデータ通信装置とは著しく異なる特徴を有するＡＶシステムにおいて、接続関係をネットワーク上で把握して、データ通信することができる。

【００６４】以上の構成によれば、親機でなるモニタ装置３において、他の機器に対して属性情報及び機器アドレスを送出すると共に、他の機器より機器アドレス及び属性情報を取得してリスト化することにより、このネットワーク上における機器間の接続関係を簡易に把握することができる。これによりこのリストを基準にして接続可能な機器をリスト化することにより、単に各機器間をケーブルにより接続するだけの簡易な接続作業により、システムを設置することができる。

【００６５】（２）第２の実施の形態
図５は、本発明の第２の実施の形態に係るＡＶシステムを示すブロック図である。このＡＶシステム３０は、チューナー３１Ａ、光ディスク装置３２Ａ、モニタ装置３３Ａにより１つの部屋でネットワークを形成し、またチューナー３１Ｂ、光ディスク装置３２Ｂ、モニタ装置３３Ｂにより他の部屋でネットワークを形成し、この２つのネットワークを接続器３４により接続する。

【００６６】このとき各ネットワークにおいては、光ディスク装置３２Ａ、モニタ装置３３Ａ、光ディスク装置３２Ｂ、モニタ装置３３Ｂがそれぞれ親器を構成するようになされている。

【００６７】接続器３４は、各ネットワークのバスＢＵＳ１及びＢＵＳ２を接続するブリッジでなる。これによりこの実施の形態において、ＡＶネットワーク３０は、共通のパケットが伝送されるバスＢＵＳ１及びＢＵＳ２に、それぞれチューナー、光ディスク装置及びモニタ装置が１系統ずつ配置されるようになされている。

【００６８】ここで図６は、第１の部屋のネットワークを示すブロック図である。なお第２の部屋のネットワークについても同様の構成でなることにより、重複した説明は省略する。また図１について上述した構成と同一の構成は、対応する符号を付して示し、重複した説明は省略する。

【００６９】このネットワークのチューナー３１Ａにおいて、ネットワークインターフェース３５は、上述の第１の実施の形態の場合と同様に、機器アドレスを取得し、電源起動時、属性情報メモリ３７に格納された属性情報と、アドレスメモリ１２Ａに格納された機器アドレスを送出する。さらにバスＢＵＳを監視して、必要なデータを制御部８Ａ及びバスＢＵＳの間で、又は接続応答部３６及びバスＢＵＳの間で入出力する。

【００７０】接続応答部３６は、ネットワークインターフェース３５を介して接続要求ＲＡが入力されると、この接続要求ＲＡに対応してチューナー３１Ａを接続可能か否か判定する。ここでこの接続要求ＲＡは、親機より、データ入出力形式を指定してバスＢＵＳ１、ＢＵＳ２に

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放送される。接続応答部３６は、属性情報メモリ３７に格納したチューナー２Ａの属性情報ＢＡを読み出し、この属性情報ＢＡにより規定されたデータ出力形式と、接続要求ＲＡのデータ入出力形式とが一致するとき、接続可能と判定する。さらに接続応答部３６は、接続可能と判定した場合、親器の送信先アドレスを指定して属性情報、機器アドレスＡＡを返送する。これによりこの実施の形態において、子機でなるチューナー３１Ａは、親器からの要求に応じて接続可能か否か判定して、判定結果を出力するようになされ、このとき制御に必要な機器アドレス、属性情報を送出する。

【００７１】光ディスク装置３２Ａにおいて、映像入出力部３９は、制御部４０により制御されて動作を切り換え、記録時、ネットワークインターフェース４１を介してバスＢＵＳよりビデオ信号及びオーディオ信号を入力し、このビデオ信号及びオーディオ信号を光ディスクの記録に適した符号化方式により符号化処理する。さらに映像入出力部３９は、この符号化処理により得られる符号化データを記録再生部４２に出力する。これに対して映像入出力部３９は、再生時、記録再生部４２の出力信号を復調してビデオ信号及びオーディオ信号を再生し、ネットワークインターフェース４１を介して、このビデオ信号及びオーディオ信号を送出する。

【００７２】記録再生部４２は、同様に制御部４０により制御されて動作を切り換え、記録時、映像入出力部３９より出力される符号化データを光ディスクに記録するのに対し、再生時、この光ディスクに記録された符号化データを再生して出力する。これにより光ディスク装置３２Ａは、バスＢＵＳを介して入力されるビデオ信号及びオーディオ信号を光ディスクに記録し、また光ディスクより再生したビデオ信号及びオーディオ信号をバスＢＵＳに出力する。

【００７３】ネットワークインターフェース４１は、ＩＥＥＥ１３９４に規定された通信処理を実行する入出力回路により構成され、チューナー２Ａのネットワークインターフェース３５と同様にして機器アドレスＡＤを取得し、この機器アドレスＡＤをアドレスメモリ４４に格納する。かくするにつきこの実施の形態では、バスＢＵＳ１及びＢＵＳ２を接続器３４で接続していることにより、これら光ディスク装置３２Ａ及びチューナー３１Ａのアドレスメモリ４４に格納される機器アドレスにおいて、第１及び第２の部屋でバスアドレスが相違することになる。

【００７４】またネットワークインターフェース４１は、バスＢＵＳの状態を監視し、例えば何れかの機器がバスＢＵＳより切り離されると、この状態を検出する。さらにこの検出結果に基づいて、改めて機器アドレスＡＤの検出処理を実行する。さらにネットワークインターフェース４１は、この機器アドレスの再検出を接続検出部４６に通知する。

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【００７５】ネットワークインターフェース４１は、この取得した機器アドレスを基準にしてバスＢＵＳを監視し、自己の機器を指定するパケットデータがバスＢＵＳ上に送出されると、このパケットのデータを取り込んで制御部４０、接続制御部４７、接続応答部４８等に出力する。

【００７６】このうち接続応答部４８は、ネットワークインターフェース４１を介して接続要求ＲＤが入力されると、この接続要求ＲＤに対応して光ディスク装置３２Ａを接続可能か否か判定する。ここで接続応答部４８は、属性情報メモリ４９に格納した光ディスク装置３２Ａの属性情報ＢＤを読み出し、この属性情報ＢＤにより規定されたデータ出力形式と、接続要求ＲＤのデータ入出力形式とが一致するとき、接続可能と判定する。さらに接続応答部４８は、接続可能と判定した場合、親器の送信先アドレスを指定して属性情報、機器アドレスＡＤを返送する。これによりこの実施の形態において、親器でなる光ディスク装置３２Ａは、子機と同様に、他の親器からの要求に応じて接続可能か否か判定して、判定結果を出力するようになされ、このとき制御に必要な機器アドレス、属性情報を送出するようになされている。

【００７７】これに対して接続検出部４６は、ネットワークインターフェース４１からの通知によりバスの接続が変更された場合、光ディスク装置３２Ａの主電源が投入された場合、さらには光ディスク装置３２Ａの操作子が操作された場合を検出することにより、接続関係の設定開始条件を満足する場合を検出する。さらに接続検出部４６は、この検出結果を接続要求部５０、接続制御部４７に通知する。

【００７８】接続要求部５０は、この接続検出部４６の通知に従って、接続関係の設定が必要になると、接続対象属性メモリ５２に格納した接続可能対象の属性情報を送出する。このとき接続要求部５０は、この光ディスク装置３２Ａの機器アドレスを併せて送出し、これにより接続可能か否かの判定結果が各機器より光ディスク装置３２Ａに向けて返送されるようになされている。

【００７９】ここで接続可能対象の属性情報は、この光ディスク装置３２Ａが接続可能な相手機器のデータ形式により規定され、各機器の属性情報メモリ３７に保持されてなる属性情報のデータ出力形式と対応するようになされている。これにより接続要求部５０は、この光ディスク装置３２Ａに接続可能な機器を問い合わせ、例えばチューナー３１Ａが接続可能な場合、このチューナー３１Ａの接続応答部３６より機器アドレス及び属性情報が返送されることになる。また同様にして、モニタ装置３３Ａ、３３Ｂ、チューナー３１Ｂ、光ディスク装置３２Ｂからも機器アドレス及び属性情報が返送されることになる。

【００８０】接続制御部４７は、このように返送される機器アドレス及び属性情報を接続可能リストメモリ５４

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に蓄積し、これにより光ディスク装置３２Ａに接続可能な機器のリストでなる接続可能リストを作成する。

【００８１】さらに接続制御部４７は、制御部４０からの要求により、又は他の子機等からの要求により、さらにはこの接続可能リストの作成に引き続いて、接続可能リストを検索し、この接続可能リストに登録された接続の順位に従って最も適切な機器に対して動作開始の制御コマンド、光ディスク装置を送出先にしてなる送出先の機器アドレスを発行する。さらに接続制御部４７は、制御部４０との間のデータ通信により必要に応じて光ディスク装置３２Ａの主電源を立ち上げ、これによりユーザーの操作に応動して最も適切な機器との間でビデオ信号及びオーディオ信号を入出力する。

【００８２】接続判定部５６は、接続制御部４７からの要求に応じて、接続可能リストに接続順位を登録する。ここでこの実施の形態において、チューナー３１Ａ、３１Ｂ、光ディスク装置３２Ｂ、モニタ装置３３Ａ、３３Ｂより属性情報及び機器アドレスが返送され、これらの属性情報及び機器アドレスにより接続可能リストが作成されるとする。

【００８３】接続判定部５６は、この機器アドレスより、最もアドレス値の近接した機器アドレスから順次接続順位を設定して登録する。これにより接続判定部５６は、同一の部屋に配置されたチューナー３１Ａをチューナー３１Ｂより優先して選択するように、接続順位を設定する。これによりこの実施の形態においては、単にケーブルを接続するだけの簡易な設置作業により、各機器間の接続関係を把握すると共に、必要に応じて最も適切な機器を選択して接続関係を設立できるようになされている。

【００８４】さらに接続判定部５６は、この光ディスク装置３２Ａの操作により接続機器を判定する場合において、例えば接続可能リストに何ら属性情報及び機器リストが格納されていない場合、すなわち所定期間経過しても何ら接続可能な機器の応答が得られない場合、報知部５８を駆動してユーザーに警告を発生する。

【００８５】図７は、モニタ装置３３Ａを示すブロック図である。この図７において、図６の光ディスク装置について上述した構成と同一の構成は、対応する符号を付して示し重複した説明は省略する。このモニタ装置３３Ａにおいても、光ディスク装置３２Ａと同様に、必要に応じて機器アドレスＡＣを取得し、他の親機より接続要求ＲＣが入力されると、接続可能か否か判定する。さらに接続可能な場合は、機器アドレスＡＣ及び属性情報を出力する。

【００８６】さらにモニタ装置３３Ａは、接続検出部４６の通知に従って、接続関係の設定が必要になると、接続対象属性メモリ５２に格納した接続可能対象の属性情報を送出して接続可能か否かの判定結果を各機器より受け、この判定結果により接続可能リストを作成する。さ

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らに接続判定部５６によりこの接続可能リストに接続順位を設定する。

【００８７】これによりモニタ装置３３Ａは、例えばユーザーが電源を立ち上げてチューナーを選択した場合、この接続順位に従って、同じ部屋に配置されてなるチューナー３１Ａを起動した後、このチューナー３１Ａよりビデオ信号及びオーディオ信号の入力を開始する。

【００８８】図６に示す構成において、ＡＶシステム３０においては（図５、図６、図７）、バスＢＵＳ１、ＢＵＳ２にチューナー３１Ａ等の機器が接続されてアイドリングの電源が立ち上げられると、この接続された機器のネットワークインターフェース３５、４１により、バスＢＵＳ１、ＢＵＳ２に接続された各機器の機器アドレスが問い合わされ、バスＢＵＳ１、ＢＵＳ２に未設定の機器アドレスＡＡ、ＡＤ、ＡＣが各機器に設定される。

【００８９】またこのネットワークインターフェース３５、４１により、バスＢＵＳ１、ＢＵＳ２の状態が監視され、バスＢＵＳ１、ＢＵＳ２の接続が変更されると、同様にして、機器アドレスＡＡ、ＡＤ、ＡＣが再設定される。

【００９０】このようなバスＢＵＳ１、ＢＵＳ２の接続変更は、各親機３２Ａ、３３Ａ、……の接続検出部４６により、併せて各親機３２Ａ、３３Ａ、……の主電源が投入された場合、さらには各親機３２Ａ、３３Ａ、……の操作子が操作された場合と同様に検出され、この検出結果が接続要求部５０、接続制御部４７に通知されて、接続関係の設定処理が開始される。

【００９１】例えばバスの接続変更が検出された場合、この接続変更は、第１及び第２の部屋の各親機により検出される。このうち第１の部屋のモニタ装置３３Ａ及び光ディスク装置３２Ａにおいては、図８に示すように、それぞれステップＳＰ４０及びステップＳＰ４１で、接続検出部４６によりこの接続の変更が検出される。

【００９２】これによりモニタ装置３３Ａは、ステップＳＰ４２に移り、接続要求部５０から接続対象属性メモリ５２に格納した接続可能対象の属性情報を送出し、他の機器に対して、接続可能か否かの問い合わせを発行する。また同様に光ディスク装置３２Ａは、ステップＳＰ４３に移り、接続要求部５０から他の機器に対して接続可能か否かの問い合わせを発行する。

【００９３】これによりモニタ装置３３Ａは、続くステップＳＰ４４において、光ディスク装置３２Ａの問い合わせに応動して、接続応答部４８により自己の属性情報と問い合わせされた属性情報とを比較し、これにより光ディスク装置３２Ａに対してモニタ装置３３Ａを接続可能か否か判定する。さらにモニタ装置３３Ａは、接続可能と判定した場合、続くステップＳＰ４５において、接続応答部４８により自己の属性情報と機器アドレスとを光ディスク装置３２Ａに送出する。

【００９４】これに対して同様の親機でなる光ディスク

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装置３２Ａは、続くステップＳＰ４６において、モニタ装置３３Ａの問い合わせに応動して、接続応答部４８により自己の属性情報と問い合わせされた属性情報とを比較し、これによりモニタ装置３３Ａに対して光ディスク装置３２Ａを接続可能か否か判定する。さらに光ディスク装置３２Ａは、接続可能と判定した場合、続くステップＳＰ４７において、接続応答部４８により自己の属性情報と機器アドレスとをモニタ装置３３Ａに送出する。

【００９５】また子機でなるチューナー３１Ａにおいては、続くステップＳＰ４８において、それぞれモニタ装置３３Ａ及び光ディスク装置３２Ａの問い合わせに応動して、接続応答部４８により自己の属性情報と問い合わせされた属性情報とを比較し、これによりモニタ装置３３Ａに対してチューナー３１Ａを接続可能か否か、光ディスク装置３２Ａに対してチューナー３１Ａを接続可能か否か判定する。さらにチューナー３１Ａは、それぞれについて接続可能と判定した場合、続くステップＳＰ４９において、接続応答部４８により自己の属性情報と機器アドレスとをそれぞれ光ディスク装置３２Ａ及びモニタ装置３３Ａに送出する。

【００９６】これによりモニタ装置３３Ａでは、接続可能な機器より属性情報及び機器アドレスを取得することができ、続くステップＳＰ５０においてこれら属性情報及び機器アドレスを受信した後、ステップＳＰ５１においてこれらの属性情報及び機器アドレスから接続可能リストを作成する。また同様に、光ディスク装置３２Ａでも、接続可能な機器より属性情報及び機器アドレスを取得することができ、続くステップＳＰ５２においてこれら属性情報及び機器アドレスを受信した後、ステップＳＰ５３においてこれらの属性情報及び機器アドレスから接続可能リストを作成する。

【００９７】なおこの場合モニタ装置３３Ａにおいては、属性情報に含まれる機器の種別に従って、光ディスク装置３２Ａよりチューナー３１Ａの方を優先して接続するように、接続の順位を設定して接続可能リストを作成する。これによりモニタ装置３３Ａにおいては、ユーザーの使用頻度に対応するように接続の順位を設定して使い勝手を向上するようになされている。

【００９８】これによりこの実施の形態において、モニタ装置３３Ａは、第１の部屋に配置したチューナー３１Ａ、光ディスク装置３２Ａ、第２の部屋に配置したチューナー３１Ｂ、光ディスク装置３２Ｂより属性情報及び機器リストを取得して接続可能リストを作成することになり、光ディスク装置３２Ａは、第１の部屋に配置したチューナー３１Ａ、モニタ装置３３Ａ、第２の部屋に配置したチューナー３１Ｂ、光ディスク装置３２Ｂ、モニタ装置３３Ａより属性情報及び機器リストを取得して接続可能リストを作成することになる。

【００９９】このようにして接続可能リストを作成すると、モニタ装置３３Ａでは、続くステップＳＰ５４にお

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いて、接続判定部５６により接続可能リストがアクセス
され、同種の機器間で機器アドレスが比較される。さら
に続くステップＳＰ５５においてこの比較結果より、自
己の機器に対して最もアドレス値の近接した機器アドレ
スから順次接続順位を設定して登録した後、ステップＳ
Ｐ５６に移ってこの処理手順を終了する。これによりモ
ニタ装置３３Ａでは、同室のチューナー３１Ａ、光ディス
ク装置３２Ａを、異なる部屋に配置したチューナー３１
Ｂ、光ディスク装置３２Ｂに優先して接続するように、
優先順位を設定登録する。

【０１００】同様にして光ディスク装置３２Ａでは、続
くステップＳＰ５７において、接続判定部５６により接
続可能リストがアクセスされ、同種の機器間で機器アド
レスが比較される。さらに続くステップＳＰ５８におい
てこの比較結果より、自己の機器に対して最もアドレス
値の近接した機器アドレスから順次接続順位を設定して
登録した後、ステップＳＰ５９に移ってこの処理手順を
終了する。これにより光ディスク装置３２Ａでは、同室
のチューナー３１Ａ、モニタ装置３３Ａを、異なる部屋に
配置したチューナー３１Ｂ、モニタ装置３３Ｂに優先して
接続するように、優先順位を設定登録する。

【０１０１】各親機３２Ａ、３３Ａ、……の主電源が投
入された場合、さらには各親機３２Ａ、３３Ａ、……の
操作子が操作された場合には、この一連の処理が、操作
対象となった親機において実行され、これにより該当す
る親機で接続可能リストが作成され、また接続順位が設
定登録される。

【０１０２】これによりこの接続順位に従って、モニタ
装置３３Ａ等においては、適切な機器との間でビデオ信
号及びオーディオ信号を入出力する。

【０１０３】すなわち図９に示すように、例えばモニタ
装置３３Ａの主電源が投入された場合、モニタ装置３３
Ａにおいては、接続可能リストを作成した後、又は接続
可能リストの作成と並行して、ステップＳＰ６０におい
て、制御部４０により全体の動作を立ち上げた後、続く
ステップＳＰ６１でこの接続可能リストを検索する。

【０１０４】続いてモニタ装置３３Ａは、ステップＳＰ
６２において、この接続可能リストの接続順位より、チ
ューナー３１Ａに対して、モニタ装置３３Ａを送信先アド
レスに設定してビデオ信号及びオーディオ信号の送出を
開始する旨、制御コマンドを発行する。これに対応して
チューナー３１Ａにおいては、ステップＳＰ６３におい
て、この制御コマンドを受信した後、続くステップＳＰ
６４で送信先アドレスをモニタ装置３３Ａの機器アドレ
スに設定してビデオ信号及びオーディオ信号の送信を開
始する。

【０１０５】これによりモニタ装置３３Ａは、ステップ
ＳＰ６５において、このビデオ信号及びオーディオ信号
の受信を開始し、他の部屋に配置したチューナー３１Ｂに
優先して、同じ部屋に配置したチューナー３１Ａで受信し

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たビデオ信号及びオーディオ信号をモニタする。

【０１０６】以上の構成によれば、親機からの問い合わ
せにより、接続可能か否か判定して属性情報及び機器ア
ドレスを送出し、この送出された属性アドレス及び機器
アドレスから接続可能リストを作成するようにしても、
第１の実施の形態と同様の効果を得ることができる。

【０１０７】さらにこの接続可能リストの機器アドレス
を順次比較して接続順位を設定し、この接続順位に従っ
てビデオ信号等を入出力して順次機器間を接続すること
により、単に各機器間をケーブルにより接続するだけの
簡易な接続作業により、ユーザーの必要とする機器を優
先的に接続することができ、これにより使い勝手を向上
することができる。

【０１０８】（３）第３の実施の形態
図１０及び図１１は、それぞれ図６及び図７との対比よ
り第３の実施の形態に係るＡＶシステムを示すブロック
図である。このＡＶシステム６０は、操作子の操作によ
り接続順位を設定する。

【０１０９】すなわち光ディスク装置６２Ａ及びモニタ
装置６３Ａは、それぞれ接続設定の操作子６５が配置さ
れ、各接続検出部６７においては、第２の実施の形態に
ついて上述した各条件を満足する場合に加えて、各操作
子６５が押圧操作された場合にも、接続可能リストの作
成を通知する。

【０１１０】これに対して子機側でなるチューナー３１
Ａ、各親機３２Ａ及び３３Ａにおいては、優先接続の操
作子６６を有し、この操作子６６が押圧操作されている
場合、各接続応答部６８は、接続可能か否かの問い合わ
せに対して、操作子６６の押圧操作に対応する識別デー
タＤ１を付加して、属性情報及び機器情報を出力する。

【０１１１】光ディスク装置６２Ａ及びモニタ装置６３
Ａにおいて、接続判定部６９は、この問い合わせにより
作成された接続可能リストに接続順位を設定する際に、
この操作子６６の押圧操作に対応する識別データＤ１の
付加された機器については、同種の機器に対して、最優
先の接続順位を登録する。

【０１１２】これによりこの図１０及び図１１の構成に
おいては、接続設定の操作子６５と他の機器の優先接続
の操作子６６とを同時に押圧するだけの簡易な操作によ
り、各親機に対して優先的に接続する機器を登録するこ
とができる。これにより第２の実施の形態について上述
した接続順位を、必要に応じてユーザーの所望の順序に
再設定することができ、これにより第２の実施の形態に
比してさらに一段と使い勝手を向上することができる。

【０１１３】（４）第４の実施の形態
図１２及び図１３は、それぞれ図６及び図７との対比よ
り第４の実施の形態に係るＡＶシステムを示すブロック
図である。このＡＶシステム７０は、リモートコマンダ
７５により接続順位を設定する。

【０１１４】すなわち光ディスク装置７２Ａ及びモニタ

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装置７３Ａは、それぞれリモコン受信部７６を有し、各接続検出部７７においては、第２の実施の形態について上述した各条件を満足する場合に加えて、リモコン受信部７６を介してリモートコマンダ７５の操作が検出されると、接続可能リストの作成を通知する。

【０１１５】これに対して子機側でなるチュナー７１Ａ、各親機７２Ａ及び７３Ａにおいて、各接続応答部７８は、接続可能か否かの問い合わせに対して、リモコン受信部７６を介してリモートコマンダ７５の操作が検出されると、識別データＤ１を付加して、属性情報及び機器情報を出力する。

【０１１６】これによりこの図１２及び図１３の構成においては、リモートコマンダ７５の遠隔操作信号が同時に受信される範囲の機器を優先的に接続するように、接続順位を登録することができる。これにより第２の実施の形態について上述した接続順位を、リモートコマンダ７５を基準にして再設定することができ、これにより第２の実施の形態に比してさらに一段と使い勝手を向上することができる。

【０１１７】（５）他の実施の形態
なお上述の第２～第４の実施の形態においては、接続要求の問い合わせ先で接続可能か否か判定して応答する場合について述べたが、本発明はこれに限らず、問い合わせに対する応答より問い合わせ元で判定してもよい。

【０１１８】また上述の第２～第４の実施の形態においては、主電源が立ち上げられた等の条件により他の機器に接続を問い合わせる場合について述べたが、本発明はこれに限らず、必要に応じて種々の条件により接続を問い合わせることができ、例えば接続の必要な場合にその都度問い合わせるようにしてもよい。このようにすれば接続可能リストを保持する必要がなく、その分全体構成を簡略化することができる。

【０１１９】また上述の実施の形態においては、問い合わせに対して、単に接続可能か否か判定して応答する場合について述べたが、本発明はこれに限らず、必要に応じて動作中か否かの条件を加味して応答してもよい。このようにすれば、既に動作中の機器を接続対象から除外することができる。

【０１２０】さらに上述の実施の形態においては、チュナー、光ディスク装置、モニタ装置によりＡＶシステムを構成する場合について述べたが、本発明はこれに限らず、ビデオテープレコーダ等、種々のビデオ機器によりＡＶシステムを構成する場合に広く適用することができる。

【０１２１】また上述の実施の形態においては、ＡＶシステムに本発明を適用してＩＥＥＥ１３９４により各機器を接続する場合について述べたが、本発明はこれに限らず、種々のシリアルインタフェース、パラレルインターフェースによりオーディオシステムを構成するオーディオ機器、さらには種々の通信ネットワーク機器に広く適用することができる。

【０１２２】
【発明の効果】上述のように本発明によれば、各機器の属性を示す情報と機器アドレスを送受し、この属性情報に基づいて接続可能か否か判定することにより、単にケーブルを接続するだけで、対応する機器間で種々の情報信号を送受することができ、これにより機器の設置作業を簡略化することができる。

【０１２３】またこのときこの属性情報等に基づいて、接続順位を設定することにより、例えば同室の機器等を優先して接続することができ、使い勝手を向上することができる。

【図面の簡単な説明】

【図１】本発明の第１の実施の形態に係るＡＶシステムを示すブロック図である。

【図２】図１のＡＶシステムに適用されるパケットを示す略線図である。

【図３】図１のＡＶシステムの動作の説明に供するタイムチャートである。

【図４】図３に続く動作の説明に供するタイムチャートである。

【図５】本発明の第２の実施の形態に係るＡＶシステムを示すブロック図である。

【図６】図５のＡＶシステムのチュナー及び光ディスク装置の詳細構成を示すブロック図である。

【図７】図５のＡＶシステムのモニタ装置の詳細構成を示すブロック図である。

【図８】図５のＡＶシステムの動作の説明に供するタイムチャートである。

【図９】図８に続く動作の説明に供するタイムチャートである。

【図１０】本発明の第３の実施の形態に係るＡＶシステムについて、チュナー及び光ディスク装置の詳細構成を示すブロック図である。

【図１１】図１０のＡＶシステムのモニタ装置の詳細構成を示すブロック図である。

【図１２】本発明の第４の実施の形態に係るＡＶシステムについて、チュナー及び光ディスク装置の詳細構成を示すブロック図である。

【図１３】図１２のＡＶシステムのモニタ装置の詳細構成を示すブロック図である。

【符号の説明】
１、３０、６０、７０……ＡＶシステム、２Ａ、２Ｂ、３１Ａ、３１Ｂ、６１Ａ、７１Ａ……チュナー、３、３３Ａ、３３Ｂ、６３Ａ、７３Ａ……モニタ装置、４、７５……リモートコマンダ、８Ａ、８Ｂ、１６、４０……制御部、１１Ａ、１１Ｂ、１８、３５、４１……ネットワークインターフェース、１２Ａ～１２Ｃ、４４……アドレスメモリ、１３Ａ、１３Ｂ、１９……属性情報出力部、２０、４７……接続制御部、２１、７６……リモコ

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ン受信部、２２……機器リストメモリ、２３、５４……
接続可能リストメモリ、３２Ａ、３２Ｂ、６２Ａ、７２
Ａ……光ディスク装置、３６、４８、６８、７８……接
続応答部、３７、４９……属性情報メモリ、４６、６

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７、７７……接続検出部、５０……接続要求部、５２…
…接続対象属性メモリ、５６、６９……接続判定部、６
５、６６……操作子

【図１】
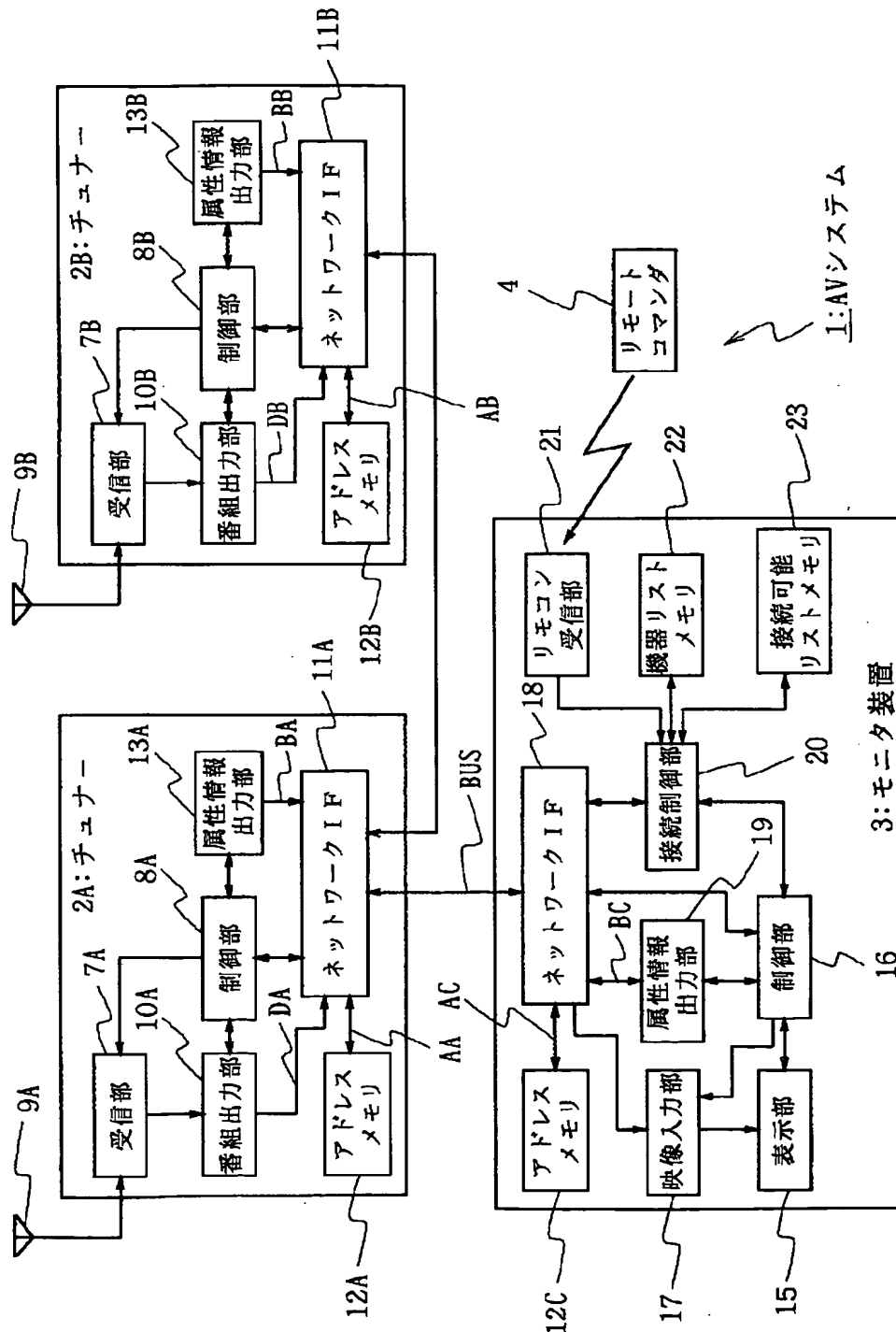
【図２】
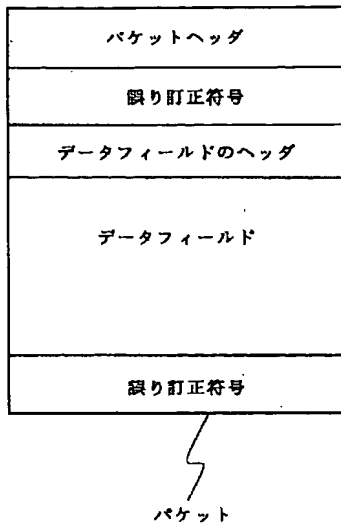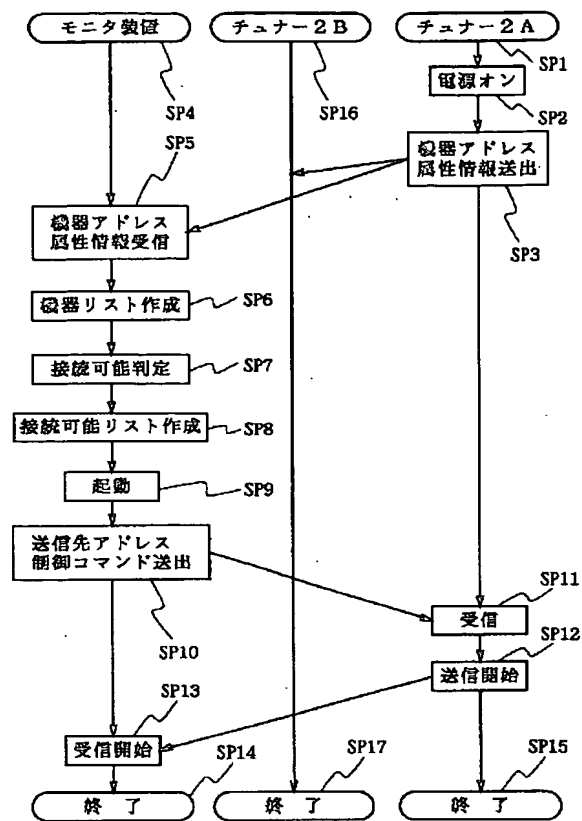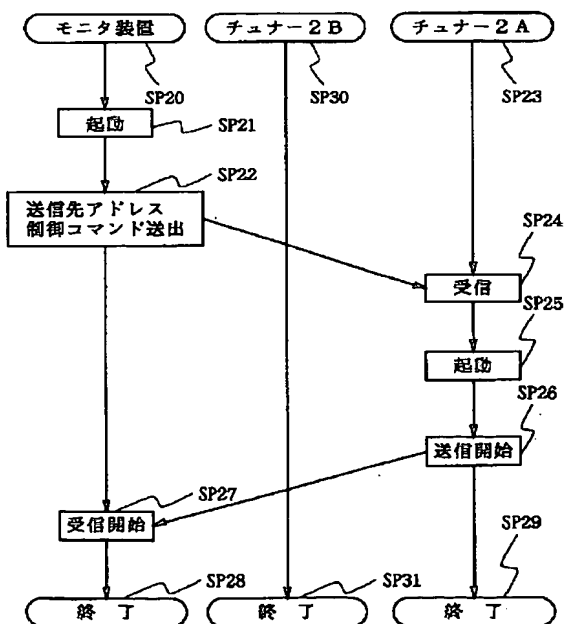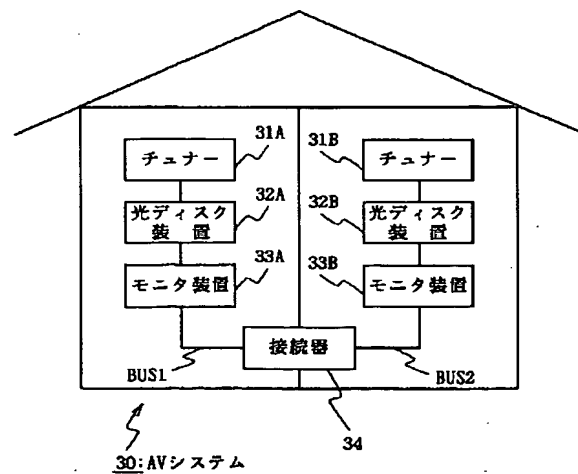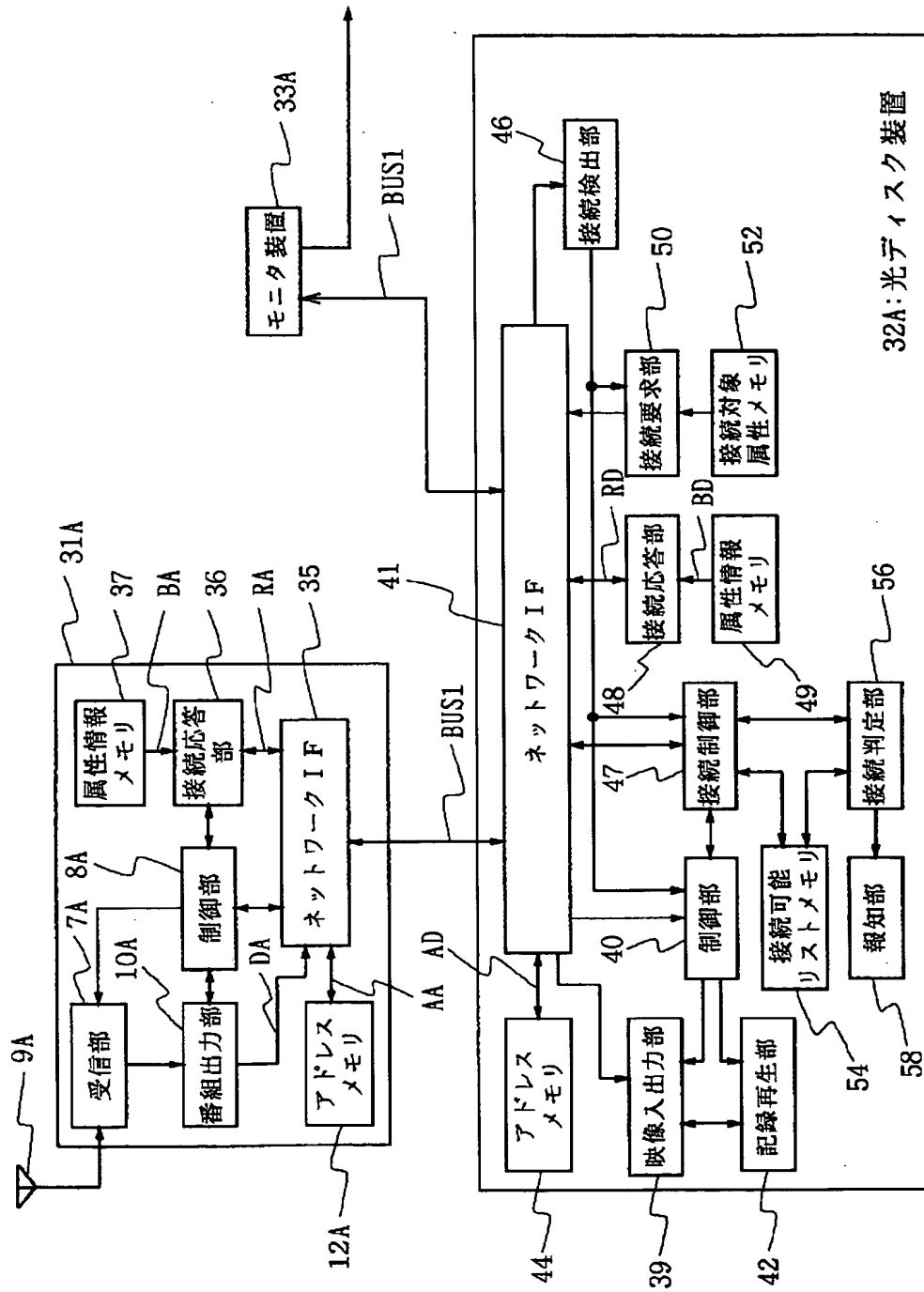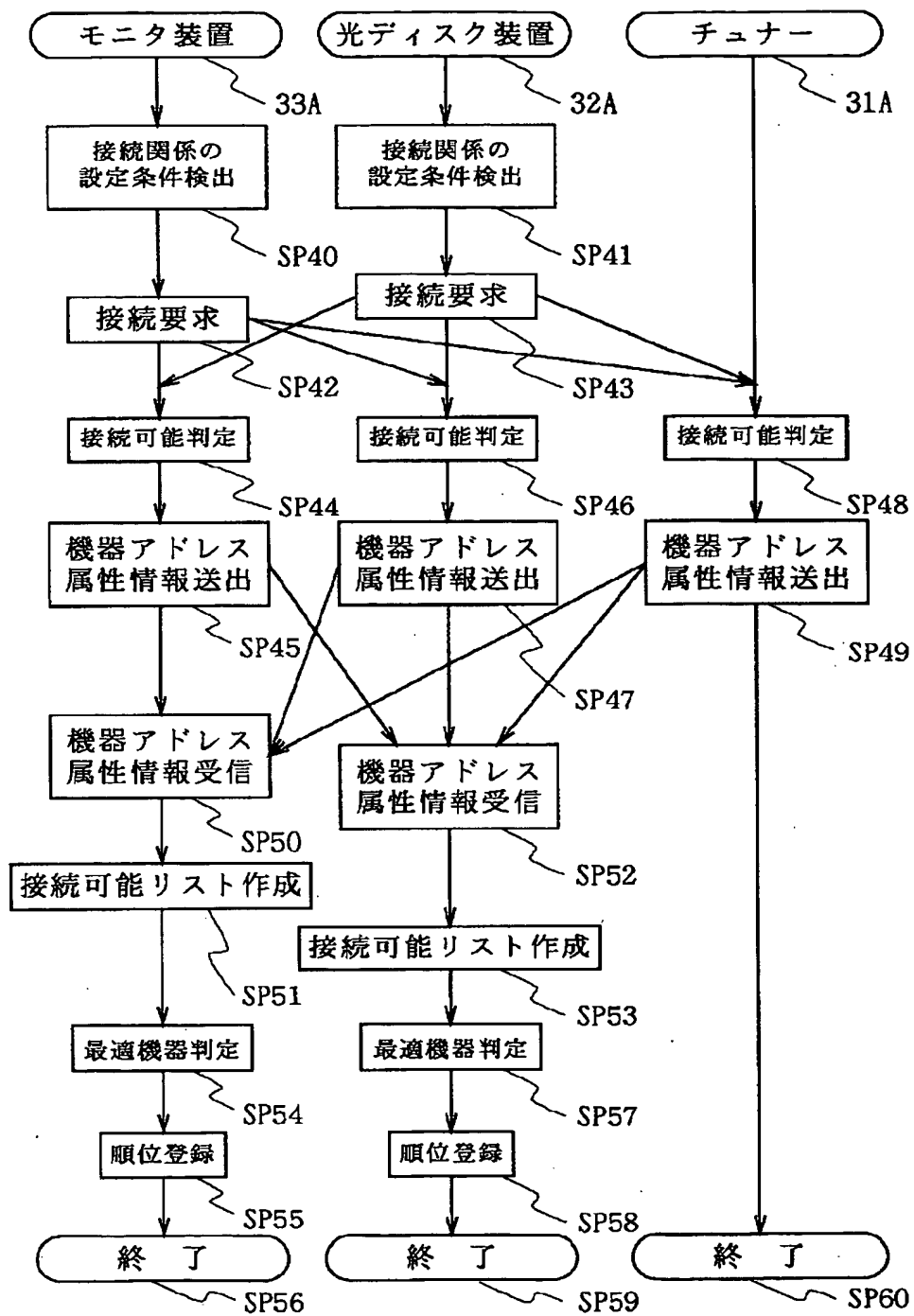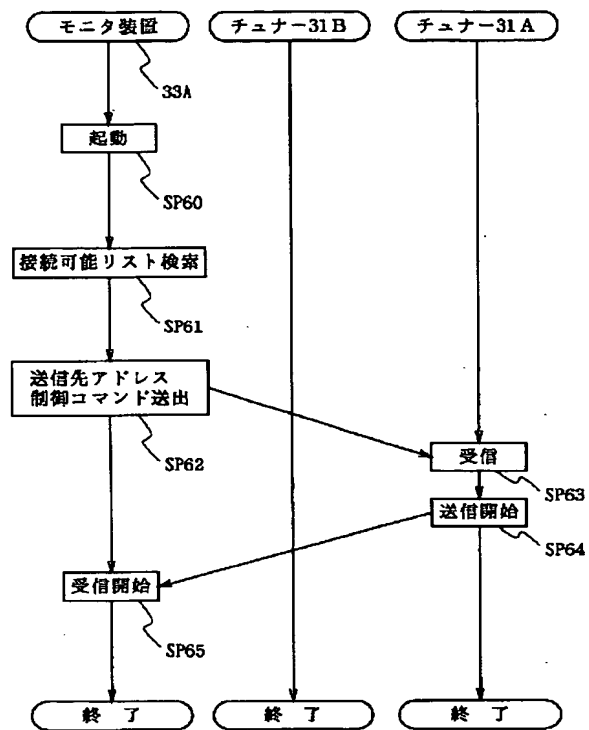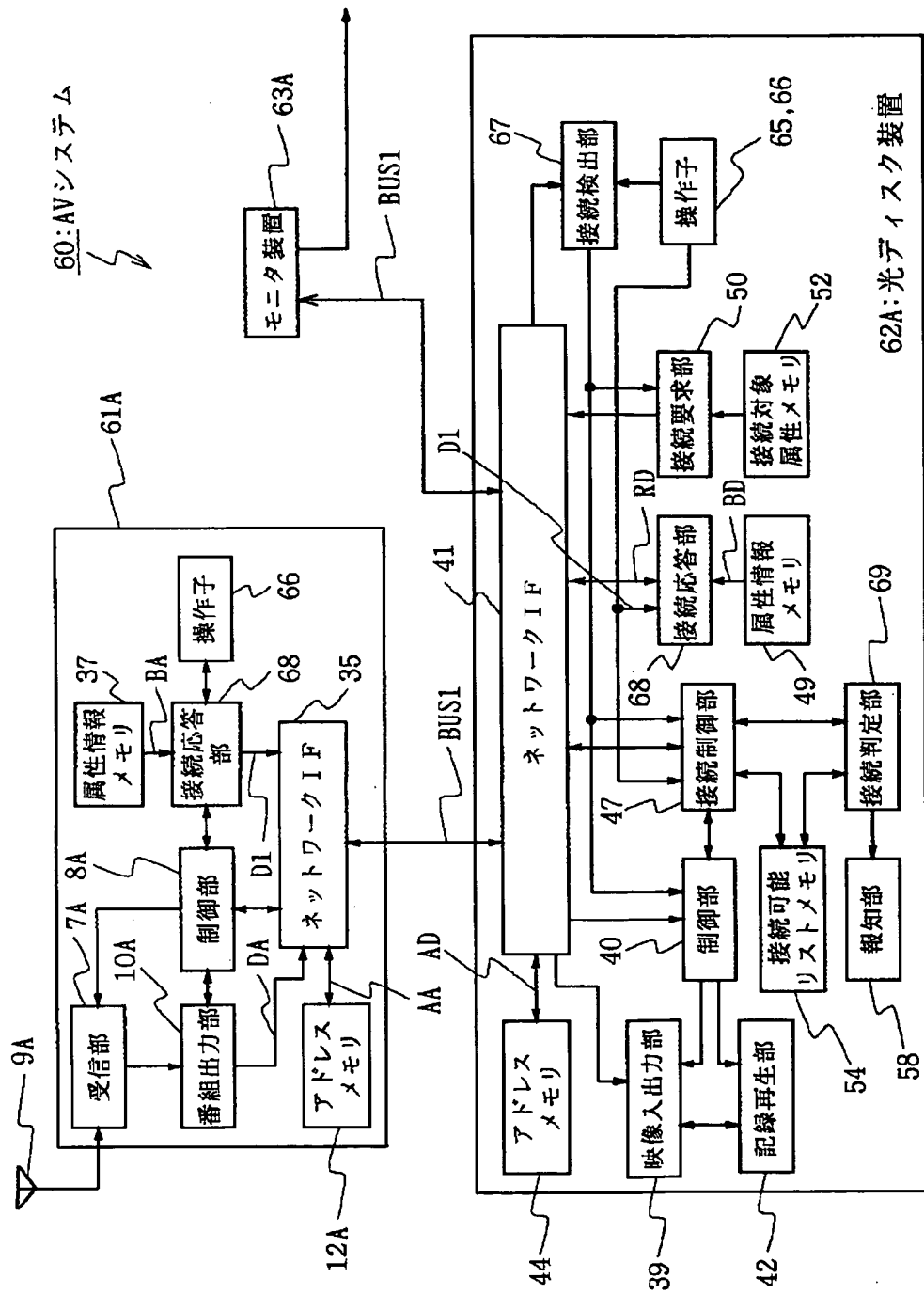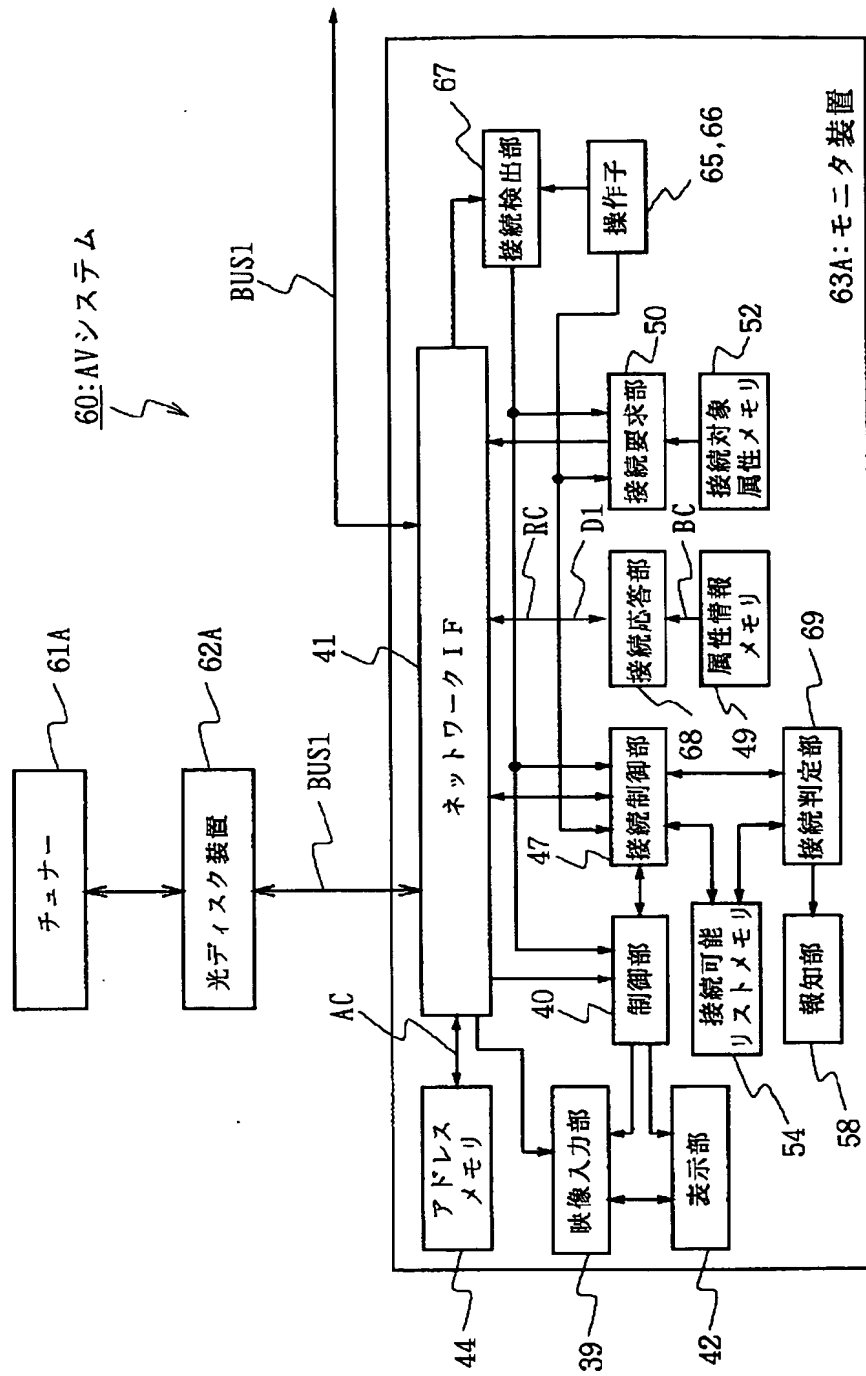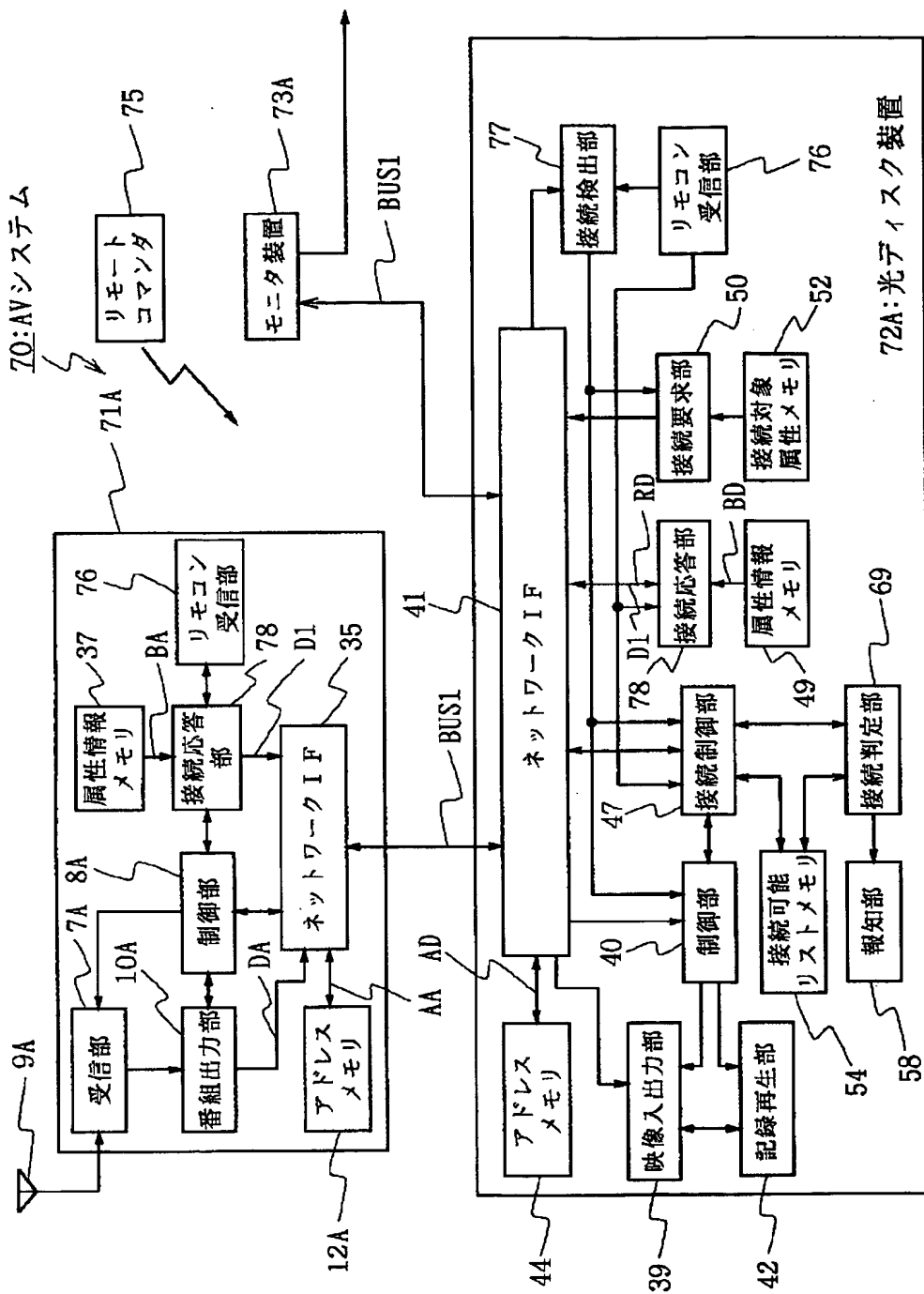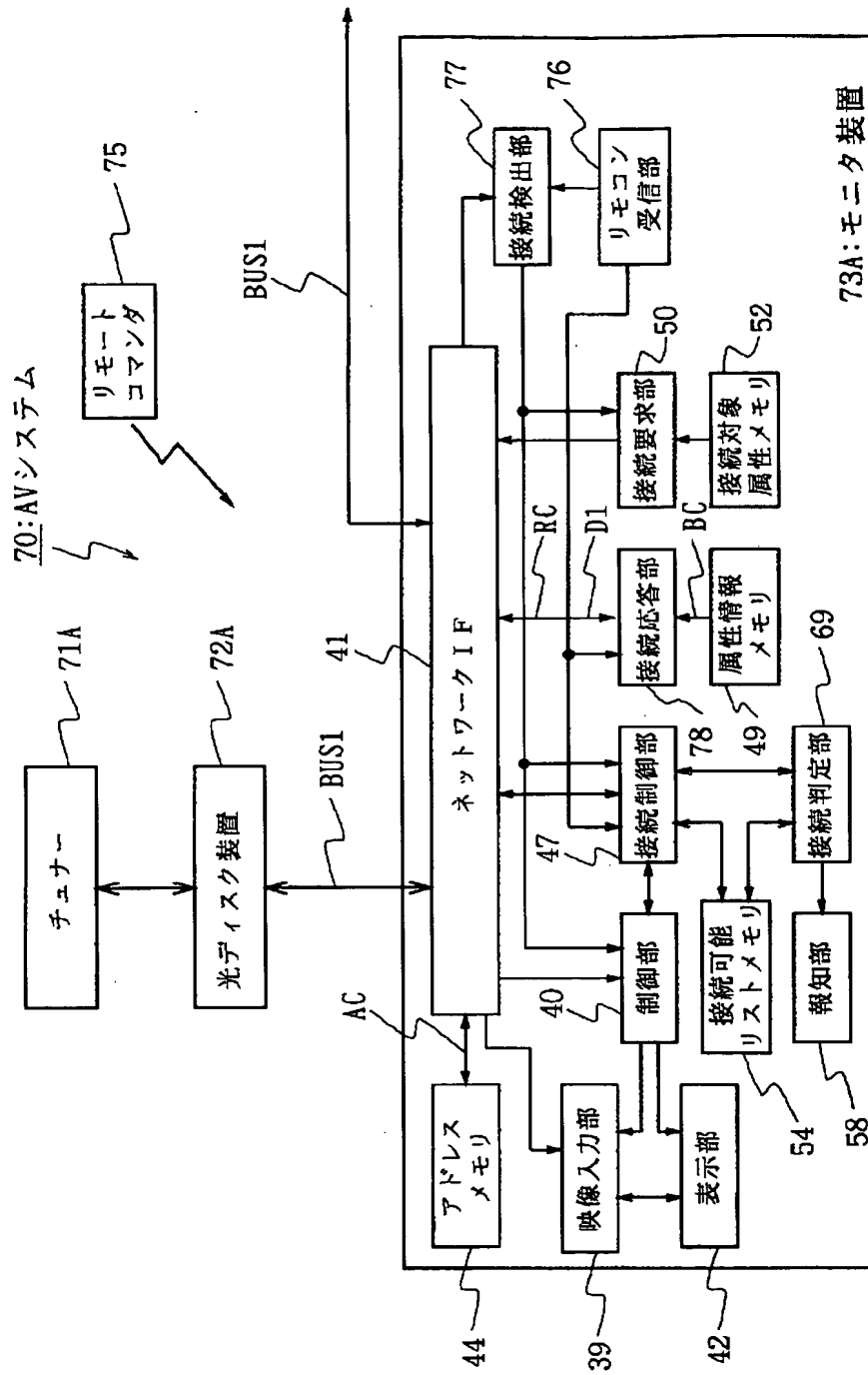
パケットヘッダ
誤り訂正符号
データフィールドのヘッダ
データフィールド
誤り訂正符号

パケット

【図３】

モニタ装置　チューナ２Ｂ　チューナ２Ａ

SP1 電源オン
SP2 機器アドレス属性情報送出
SP4
SP16
SP5 機器アドレス属性情報受信
SP3
SP6 機器リスト作成
SP7 接続可能判定
SP8 接続可能リスト作成
SP9 起動
送信先アドレス制御コマンド送出
SP11 受信
SP10
SP12 送信開始
SP13
受信開始 SP14　SP17　SP15
終了　　終了　　終了

【図４】

モニタ装置　チューナ２Ｂ　チューナ２Ａ

SP20
SP21 起動
SP30
SP23
SP22 送信先アドレス制御コマンド送出
SP24 受信
SP25 起動
SP26 送信開始
SP27
受信開始
SP28　SP31　SP29
終了　　終了　　終了

【図５】

チューナ 31A　31B チューナ
光ディスク装置 32A　32B 光ディスク装置
モニタ装置 33A　33B モニタ装置
接続器
BUS1　　　　　　　　BUS2
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30：ＡＶシステム

【図６】

【図７】

【図8】

モニタ装置	光ディスク装置	チュナー

33A　32A　31A

接続関係の設定条件検出　　接続関係の設定条件検出

SP40　SP41

接続要求　　接続要求

SP42　SP43

接続可能判定　接続可能判定　接続可能判定

SP44　SP46　SP48

機器アドレス属性情報送出　機器アドレス属性情報送出　機器アドレス属性情報送出

SP45　SP47　SP49

機器アドレス属性情報受信　機器アドレス属性情報受信

SP50　SP52

接続可能リスト作成

SP51　接続可能リスト作成

SP53

最適機器判定　最適機器判定

SP54　SP57

順位登録　順位登録

SP55　SP58

終了　終了　終了

SP56　SP59　SP60

【図９】

【図１０】

【図11】

60：AVシステム

チューナー 61A

光ディスク装置 62A

BUS1

BUS1

ネットワークIF 41

アドレスメモリ 44

映像入力部 39

表示部 42

制御部 40

接続可能リストメモリ 54

接続判定部 69

報知部 58

AC

接続制御部 68

接続応答部 49

属性情報メモリ

接続要求部 50

接続対象属性メモリ 52

接続検出部 67

操作子 65,66

RC

D1

BC

47

63A：モニタ装置

【図１２】

【図１３】

JP-10-164534-A

CLAIMS

[Claim(s)]

[Claim 1] In the information signal transmission equipment which forms a

network, and sends and receives a desired information signal The attribute

information which shows the attribute of equipment to other devices on said

network, An identification information sending-out means to send out the I/O

address which shows the address of the equipment on a network, said -- others

-- a device -- said -- others -- the attribute information on a device -- said -- others

-- the information signal transmission equipment characterized by having an

identification information acquisition means to acquire the I/O address of a

device, and a judgment means to judge whether the device of said acquired information signal and connection are possible according to said acquired attribute information.

[Claim 2] Said judgment means is information signal transmission equipment according to claim 1 characterized by judging whether it is connectable based on the comparison result of said acquired attribute information and the attribute information sent out from said identification information sending-out means.

[Claim 3] criteria [I/O address / which acquired said judgment means] -- carrying out -- said -- others -- the information signal transmission equipment according to claim 1 characterized by having a connection ranking setting means to set up the ranking of connection, and sending out said information signal according to the ranking of said connection, or inputting said information signal between devices.

[Claim 4] actuation of a handler -- following -- said -- others -- the information signal transmission equipment according to claim 1 characterized by having a connection ranking setting means to set up the ranking of connection between devices, and sending out said information signal according to the ranking of said connection, or inputting said information signal.

[Claim 5] the remote-control means of 1 -- criteria [between / controllable

devices] -- carrying out -- said -- others -- the information signal transmission

equipment according to claim 1 characterized by having a connection ranking

setting means to set up the ranking of connection between devices, and sending

out said information signal according to the ranking of said connection, or

inputting said information signal.

[Claim 6] Said attribute information is information signal transmission equipment

according to claim 1 characterized by coming to contain the information on the

model of device.

[Claim 7] Said attribute information is information signal transmission equipment

according to claim 1 characterized by coming to contain the information on the

format of said information signal which can be sent out on said network, or the

information on the format of said information signal receivable on said network.

[Claim 8] Said identification information sending-out means is information signal

transmission equipment according to claim 1 characterized by sending out said

identification information and said attribute information following the demand

from a device besides the above.

[Claim 9] said identification information sending-out means -- said -- others -- the

demand from a device -- following -- said -- others -- the information signal

transmission equipment according to claim 1 characterized by judging whether it

is connectable to a device and sending out said identification information and

said attribute information based on a judgment result.

[Claim 10] Said identification information acquisition means is information signal

transmission equipment according to claim 1 characterized by requiring sending

out of said attribute information and an I/O address from a device besides the

above, and acquiring said attribute information and I/O address.

[Claim 11] Said identification information acquisition means is information signal

transmission equipment according to claim 8 characterized by requiring sending

out of said attribute information and an I/O address, when the arrangement to

said network of a device besides the above is detected.

[Claim 12] Said identification information acquisition means is information signal

transmission equipment according to claim 8 characterized by requiring sending

out of said attribute information and an I/O address, when arranged in said

network.

[Claim 13] Said identification information acquisition means is information signal

transmission equipment according to claim 1 characterized by generating

predetermined warning when sending out of said attribute information and an I/O

address cannot be required from a device besides the above and said attribute

information and I/O address cannot be acquired.

[Claim 14] Information signal transmission equipment according to claim 1

characterized by having an information means to generate predetermined

warning when the judgment result which is not connectable between the devices

of a class by which connection is called for is obtained.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Concerning information signal transmission equipment, this invention can be applied, when connecting video equipment by IEEE 1394 (The Institute of Electrical and Electoronics Engineers, Inc.). This invention simplifies installation of a device by sending and receiving the information and the I/O address which show the attribute of each device between each device, and judging whether based on this attribute information, it is connectable.

[0002]

[Description of the Prior Art] Conventionally, various kinds of video equipment is made as [constitute / connect each video equipment by the dedicated line centering on the indicating equipment which becomes with the final output unit of this kind of video equipment, and / a system], when television CHUNA, a monitoring device, an optical disk unit, etc. are connected and it constitutes AV system.

[0003] That is, when such video equipment constitutes AV system, the video sources, such as television CHUNA and an optical disk unit, will output a video signal and an audio signal to the monitoring device which becomes for [final] an

output in any case. Thereby, in this kind of system, two or more video input terminals and an audio input terminal are arranged to a monitoring device, and a video signal and an audio signal are inputted into these video input terminal and an audio input terminal from each video source.

[0004] Moreover, to the video equipment which has record functions, such as an optical disk unit, through the external output terminal of a monitoring device, directly, the video sources, such as CHUNA, are connected and a video signal and an audio signal are inputted. In such connection, video equipment transmits a video signal and an audio signal using shielding wire and a coaxial cable, and is made as [reduce / by this / mixing of a noise etc.].

[0005] On the other hand, in the video tape recorder of camera one apparatus made as [process / with a digital signal / a video signal] etc., it is made as [input / a video signal and an audio signal /, for example to IEEE1394 / with a regular interface / output and].

[0006]

[Problem(s) to be Solved by the Invention] by the way, the thing for which the interface of such IEEE1394 uses one bus by two or more devices by time sharing -- the shape of a ring -- or a device can be connected in the shape of a

star, a network can be constituted, and it is thought that video equipment is simply connectable by this.

[0007] However, although it can simplify about the cable splicing between devices after all by being managed with the main phone which manages system-wide actuation, whether the interface of IEEE1394 outputs and inputs a video signal and an audio signal between which devices needs to set up the connection relation of a device to this main phone. That is, although the connection of a cable itself could be simplified, a device-related setup which accompanies this connection became complicated, and there was a problem with complicated installation of a device after all.

[0008] This invention was made in consideration of the above point, and in case it connects a device by the network and sends and receives a desired information signal, it tends to propose the information signal transmission equipment which can simplify installation of a device.

[0009]

[Means for Solving the Problem] In order to solve this technical problem, while the attribute information which shows the attribute of equipment to other devices on a network, and the I/O address which shows the address of the equipment on

a network are sent out in this invention, attribute information and an I/O address are acquired from other devices, and it judges whether according to this acquired attribute information, it is connectable.

[0010] According to the attribute information on other devices on a network, it can judge whether it is connectable to other devices. Moreover, a desired information signal can be sent and received on the basis of the I/O address of other devices. Moreover, in other devices, it can judge whether it is simply connectable, and a desired information signal can be outputted [if attribute information and an I/O address are sent out also to other devices] similarly and inputted. Even when various devices are arranged on a network from these things, data communication of the connection relation can be simply grasped and carried out on a network.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained in full detail, referring to a drawing suitably.

[0012] (1) Gestalt drawing 1 of the 1st operation is the block diagram showing AV system concerning the gestalt of operation of this invention. This AV system 1 connects CHUNA2A and 2B, and a monitoring device 3 by bus BUS into which

it was specified at IEEE1394, and forms a network with these CHUNA2A and 2B, and a monitoring device 3. further -- the AV system 1 -- actuation of a remote commander 4 -- or actuation is switched by direct actuation of each device, and the monitor of the video signal and audio signal which received by CHUNA2A or 2B is carried out with a monitoring device 3.

[0013] CHUNA2A and 2B explain a configuration only about CHUNA2A by becoming with the same configuration here, and the explanation which overlapped about CHUNA 2B is omitted. In this CHUNA 2A, receive section 7A is controlled by control-section 8A, switches actuation, inputs more nearly alternatively than antenna 9A the television broadcasting signal with which the user selected the song, and recovers a video signal and an audio signal from this inputted television broadcasting signal.

[0014] Program output section 10A receives the video signal and audio signal to which it restored by this receive section 7A, and carries out coding processing of this video signal and audio signal by predetermined format. Furthermore, program output section 10A outputs this video signal and audio signal DA that carried out coding processing to network interface 11A to predetermined timing according to the demand from network interface (network IF) 11A. Thereby,

CHUNA 2A outputs the video signal and audio signal DA which received through this network interface 11A to the bus BUS into which it was specified at IEEE1394.

[0015] That is, if network interface 11A is started by the idling condition after being constituted by the I/O circuit which performs the communications processing specified to this IEEE1394 and connecting this CHUNA 2A to Bus BUS, it will perform network interface 11B of each device connected to this bus BUS, etc. and predetermined communications processing, and, thereby, will acquire I/O address AA of CHUNA 2A.

[0016] This I/O address AA is constituted by the bus address which identifies each bus connected with the bridge, and the node address on each bus, and is made here as [set / the address which overlapped other video equipment]. In carrying out, in this network, a bus is connected with a bridge, it is constituted so that a video signal and an audio signal can be sent and received between buses, and it is made as [set / the bus address to write and which identifies each of this bus for this reason].

[0017] Network interface 11A is made as [receive / other video equipment which forms this network on the basis of this I/O address AA, and various information /

send and] while acquiring I/O address AA which is not yet assigned to other video equipment by the communication link between other video equipment and holding this acquired I/O address AA to address memory 12A.

[0018] In addition, network interface 11A will detect this condition, if the condition of Bus BUS is supervised, for example, which device is separated from Bus BUS. Furthermore based on this detection result, detection processing of I/O address AA is performed anew.

[0019] Network interface 11A is in the condition that CHUNA 2A was held at the condition of an idling, supervises Bus BUS on the basis of this acquired I/O address, if the packet data which specify a self device are sent out on Bus BUS, will incorporate the data of this packet and will output them to control-section 8A. Thereby, by CHUNA2A, the control command outputted from a monitoring device 3, for example following actuation of a remote commander 4 is incorporated, and it is made as [rise / by control-section 8A / the power source of CHUNA 2A].

[0020] Moreover, if it does in this way and a power source is started, or if a power source is risen by direct actuation of CHUNA 2A, network interface 11A will output the demand of occupancy to Bus BUS by the request from

control-section 8A, and if authorization of occupancy is obtained from other devices according to this demand, I/O address AA recorded on the attribute information BA outputted from attribute information output section 13A and address memory 12A will be outputted to Bus BUS.

[0021] Attribute information output section 13A holds the attribute information BA, and outputs this attribute information BA through network interface 11A by control of control-section 8A here. The attribute information BA is constituted by the information which shows the attribute of each device, and, in CHUNA 2A, is constituted by the format (it becomes with MPEG 2, MPEG4, a digital audio interface, etc.) of a classification code and output data which shows the manufacture name of this CHUNA 2A, and the classification (it becomes by classification, such as CHUNA and a monitoring device) of a device here. Thereby, if network interface 11A starts in the condition which can be operated, to the main phone which controls actuation of this system 1 whole, it will notify that and will notify information required for control.

[0022] Furthermore, if the packet data which specify a self device are sent out on Bus BUS after doing in this way and being in the condition that it can operate, network interface 11A will incorporate the data of this packet, and will output

them to control-section 8A. Thereby, by CHUNA2A, if initiation of operation is directed from a monitoring device 3, for example following actuation of a remote commander 4, a video signal and audio signal DA will be received from program output section 10A, and this video signal and audio signal will be outputted to Bus BUS per predetermined block. At this time, network interface 11A adds the I/O address specified by control-section 8A, and outputs a video signal and an audio signal by the packet.

[0023] In carrying out, the I/O address to write and which is specified by this control-section 8A is specified with the main phone which controls this system 1, and is acquired by control-section 8A with the control command of initiation of operation by incorporating the data of a packet and outputting to control-section 8A.

[0024] That is, in this system 1, it is made as [receive / various data / by packet communication / send and], and the error correcting code of the header data which each packet shows each packet from a head field as shown in drawing 2 , and this header data is arranged. After the header of a data field has furthermore been arranged, a data field is arranged, and the error correcting code of this data field is arranged continuously. When each packet sends out a video signal, an

audio signal, control command, etc. to each device and it acquires an I/O address further, these video signals, an audio signal, control command, etc. are assigned to a data field, and the I/O address of a transmission place is set as the header of a data field.

[0025] In carrying out, network interface 11A supervises the I/O address to write and which was set as the header of this data field, after incorporating the packet which specifies CHUNA 2A, carries out error correction processing of the data assigned to the data field, and outputs them to control-section 8A. Thereby, network interface 11A notifies the I/O address of control command and a sending-out place etc. to control-section 8A with the data assigned to this data field. Moreover, while assigning a video signal and an audio signal to this data field, the I/O address of a sending-out place is set as the header of a data field.

[0026] Control-section 8A is constituted by the computer which controls actuation of this CHUNA 2A, switches and controls the whole actuation following the control command inputted through network interface 11A following actuation of the handler which is not illustrated, receives desired television broadcasting by this, and outputs the video signal and audio signal which come to be a receiving result to Bus BUS.

[0027] Furthermore, if a power source is risen by direct actuation, control-section 8A controls network interface 11A, and sends out the I/O address and attribute information on CHUNA 2A to the complete aircraft machine on Bus BUS. In addition, the computer which constitutes this control-section 8A also constitutes attribute information output section 13A in coincidence.

[0028] Like CHUNA 2A, CHUNA 2B acquires I/O address AB and outputs the attribute information BB, I/O address AB, a video signal, and an audio signal DB to Bus BUS.

[0029] A monitoring device 3 constitutes the main phone which controls actuation of this AV system 1 whole. That is, in a monitoring device 3, a display 15 outputs the audio signal which is controlled by the control section 16, switches actuation, and displays the video signal inputted from the image input section 17, and is similarly inputted from the image input section 17. The image input section 17 is controlled by the control section 16, switches actuation, and inputs a video signal and an audio signal from Bus BUS through a network interface 18. Furthermore, the image input section 17 decodes this video signal and audio signal that were inputted, and outputs them to a display 15. Thereby, the monitoring device 3 is made as [try / it / listening the program received by

CHUNA2A and 2B].

[0030] Address memory 12C holds I/O address AC of the monitoring device 3 acquired through a network interface 18. If a network interface 18 is started by the idling condition like the network interfaces 11A and 11B of CHUNA2A and 2B after this monitoring device 3 is connected to Bus BUS, it will acquire I/O address AC of a monitoring device 3.

[0031] Furthermore, it will be in the condition that the monitoring device 3 was held at the condition of an idling, a network interface 18 supervises Bus BUS on the basis of this acquired I/O address AC, if the packet which specifies a self device is sent out on Bus BUS, will incorporate the data of this packet and will output them to a control section 16. Thereby, with the monitoring device 3, the control command outputted, for example from other main phones is incorporated, and it is made as [rise / by the control section 16 / a power source].

[0032] Moreover, if it does in this way and a power source is started, or if a power source is risen by direct actuation and actuation of a remote commander 4, a network interface 18 will output the demand of occupancy to Bus BUS by the request from a control section 16, and if authorization of occupancy is obtained according to this demand, the attribute information BC outputted from

the attribute information output section 19 will be outputted to Bus BUS.

[0033] The attribute information output section 19 in this monitoring device 3 outputs the attribute information which shows the attribute of this monitoring device 3, and this attribute information is constituted by the format of a classification code and input data which shows the manufacture name of this monitoring device 3, and the classification of a device. Thereby, if a network interface 18 starts in the condition which can be operated, to other main phones which control actuation of this whole system, it will notify that and will notify information required for control. Thereby in this AV system 1, it is made as [install / in one network / two or more sets of main phones]. In addition, this AV system 1 is made as [have / only this monitoring device 3 / a function as a main phone], and the attribute information output section 19 will perform useless procedure in the gestalt of this operation at the time of starting by this.

[0034] Furthermore, if the packet which specifies a self device is sent out on Bus BUS after doing in this way and recovering from the condition of an idling, a network interface 18 will incorporate the data of this packet, and will output them to a control section 16. Thereby, with a monitoring device 3, a video signal and an audio signal are inputted from Bus BUS, for example by control from other

main phones, and this video signal and audio signal are outputted to the image

input section 17. Thereby, the monitoring device 3 is made as [carry out / the

monitor of the video signal outputted to Bus BUS by actuation of other main

phones].

[0035] A network interface 18 will input the data of this packet, if the packet

which set the transmission place address as the default is sent out on Bus BUS

in addition to the almost same actuation as network interface 11, such as

CHUNA2A which becomes with cordless handset in this way, A. thereby, a

monitoring device 3 is required for control of this AV system 1 -- each -- the

attribute information on a cordless handset and an I/O address are acquired.

[0036] Furthermore, a network interface 18 outputs the predetermined data

which output this inputted data of a packet to the connection control section 20,

and are outputted from the connection control section 20 following this to Bus

BUS. moreover, sending out of this data -- following -- each -- the packet

obtained from a cordless handset is received and the data assigned to that data

field are outputted to the connection control section 20.

[0037] this acquired the monitoring device 3 -- each -- do based on the attribute

information on a cordless handset and an I/O address, the attribute information

further on self, and an I/O address to grasp the whole connection relation -- it is made as [control / based on this connection relation / further / the whole actuation].

[0038] Moreover, like network interface 11A of a cordless handset, if which device is separated from Bus BUS, a network interface 18 will re-detect an I/O address, and will notify it to the connection control section 20. thereby, a monitoring device 3 is required for control anew, when connection of a device is changed -- each -- it is made as [acquire / the attribute information on a cordless handset, and an I/O address / re].

[0039] A control section 16 is constituted by the computer which controls actuation of this monitoring device 3, and while it switches and controls the whole actuation following actuation of the remote commander inputted through the control command inputted through a network interface 18, the remote control receive section 21, and the connection control section 20 following actuation of the handler which is not illustrated, data communication of it is carried out between the connection control sections 20 if needed. Thereby with the monitoring device 3, it is made as [carry out / the monitor of the video signal and audio signal which are inputted through Bus BUS]. In addition, the computer

which constitutes this control section 16 also constitutes the attribute information output section 19 and the connection control section 20 in coincidence.

[0040] The remote control receive section 21 receives the remote control signal outputted from a remote commander 4, and outputs to the connection control section 20. The connection control section 20 controls connection of this AV system 1 following direct actuation of the monitoring device 3 further detected through a control section 16 following the output signal from this remote control receive section 21, and the control command detected through a network interface 18.

[0041] At this time, the connection control section 20 will incorporate this I/O address and attribute information one by one through a network interface 18, if an I/O address and attribute information are sent out from the device connected to Bus BUS. Furthermore, an equipment list and a connectable list are updated in the equipment-list memory 22 and the connectable list memory 23, respectively, and actuation of the AV system 1 whole is controlled by this I/O address and attribute information that were incorporated according to this created list.

[0042] That is, the equipment-list memory 22 memorizes the equipment list

which comes [list]-izing [the I/O address and attribute information on each device detected through this bus BUS]. Thereby, the monitoring device 3 is made as [grasp / according to this equipment list / the relation between each device connected to Bus BUS also according to the simple activity which only connected Bus BUS].

[0043] On the other hand, the connectable list memory 23 holds a connectable list, and this connectable list sequential-izes [list-] the connectable device obtained by carrying out the sequential comparison of the attribute information on this equipment list, and the attribute information on a monitoring device 3, and is created. if a user operates a remote commander 4 and, as for the connection control section 20, specifies the display of the selectable source by this -- this connectable list -- following -- each -- the information on a cordless handset is displayed on a display 15. Moreover, if a user operates a remote commander 4 according to this display, through a network interface 18, according to a connectable list and a connection list, the I/O address of a transmission place and control command are assigned to a data field, and it sends out to the device by which the user chose this I/O address and control command.

[0044] Thereby, the connection control section 20 is in the condition that the equipment list and the connectable list are not yet created, for example, performs procedure shown in drawing 3 when the power source of CHUNA 2A is started, and carries out the monitor of the video signal and audio signal which received by CHUNA 2A with a monitoring device 3.

[0045] That is, in CHUNA 2A, if it moves from a step SP 1 to a step SP 2 and the power source of CHUNA 2A is risen by direct actuation of a user here, in the continuing step SP 3, the I/O address and attribute information on CHUNA 2A will be sent out to Bus BUS from network interface 11of CHUNA 2A A.

[0046] This sent-out attribute information and an I/O address will be received in the network interface 18 of the monitoring device 3 which it comes to set as a main phone. That is, in a monitoring device 3, the connection control section 20 moves from a step SP 4 to a step SP 5, and receives the I/O address and attribute information on CHUNA 2A which were sent out to this bus BUS here through a network interface 18. Furthermore, the connection control section 20 adds this I/O address and attribute information to the equipment list of the equipment-list memory 22 in the continuing step SP 6, and generates an equipment list.

[0047] Then, it moves to a step SP 7 and the connection control section 20

judges whether this CHUNA 2A is connectable with which device from the format

of the output data assigned to the attribute information on this CHUNA 2A. If it is

judged with connection being possible from the attribute information on a

monitoring device 3 to a monitoring device 3 here, it moves to a step SP 8, and

the connectable device of CHUNA 2A will be recorded on a monitoring device 3,

and it will record CHUNA 2A on the connectable device of a monitoring device 3,

and, thereby, the connection control section 20 will update a connectable list.

[0048] Then, the connection control section 20 starts the power source of the

monitoring device 3 which becomes by the connectable device of CHUNA 2A,

when it moved to a step SP 9, the direct control of the CHUNA 2A was carried

out in this case and the user started the power source. That is, the connection

control section 20 starts the power source of this monitoring device 3 by the data

communication between control sections 16. Then, the connection control

section 20 publishes control command which moves to a step SP 10, and sets

the transmission place address as a monitoring device 3 to CHUNA 2A, and

directs transmitting initiation of a video signal and an audio signal.

[0049] This transmission place address and control command are acquired by

network interface 11of CHUNA 2A which supervises Bus BUS A in a step SP 11,

and this transmission place address and control command that were acquired

are inputted into control-section 8of CHUNA 2A A. By this, the whole actuation is

controlled by control-section 8A, and a video signal and an audio signal are

assigned to data FUIRUDO from the continuing step SP 12, and the I/O address

of a monitoring device 3 is specified in CHUNA 2A, and transmission of a video

signal and an audio signal is started.

[0050] The packet which assigned the video signal and the audio signal by the

network interface 18 of the monitoring device 3 which supervises Bus BUS by

this is received, in a monitoring device 3, in the continuing step SP 13, after

starting reception of the video signal and audio signal which were sent out from

this CHUNA 2A, it moves to a step SP 14 and this procedure is ended. Moreover,

also in CHUNA 2A, when transmission of a video signal and an audio signal is

started, it will move to a step SP 15, this procedure will be ended, and the

continuing actuation will be awaited. In addition, in CHUNA 2B, the actuation

which moves and follows a step SP 17 from a step SP 16 will be awaited in this

procedure, without being related to control in any way.

[0051] If the power source of a monitoring device 3 is started after the power

source of a monitoring device 3 and CHUNA 2A is intercepted, the connection

control section 20 will perform procedure shown in drawing 4 , and will control

the whole actuation by this condition.

[0052] namely, direct actuation -- or if the power source of a monitoring device 3

is operated by actuation of a remote commander, a monitoring device 3 will

move from a step SP 20 to a step SP 21, and a power source will be started by

the control section 16. Then, it moves to a step SP 22 and the connection control

section 20 chooses a device connectable with a monitoring device 3 from a

connectable list. In this case, in a connectable list, the connection control section

20 publishes control command which chooses CHUNA 2A as the device for

connection, and sets the transmission place address as a monitoring device 3

towards CHUNA 2A, and directs transmitting initiation of a video signal and an

audio signal by registering CHUNA 2A as a device connectable with a

monitoring device 3.

[0053] CHUNA 2A moves from a step SP 23 to a step SP 24, and acquires this

transmission place address and control command through network interface 11A.

Furthermore, by control of control-section 8A, CHUNA 2A starts a power source

according to this transmission place address and control command that were

acquired, from the continuing step SP 26, specifies the I/O address of a

monitoring device 3, and starts transmission of a video signal and an audio

signal.

[0054] In the network interface 18 of the monitoring device 3 which supervises

Bus BUS by this, the packet which assigned the video signal and the audio

signal is received, with a monitoring device 3, in the continuing step SP 27, after

starting reception of the video signal and audio signal which were sent out from

this CHUNA 2A, it moves to a step SP 28 and this procedure is ended. Moreover,

also in CHUNA 2A, when transmission of a video signal and an audio signal is

started, it will move to a step SP 29, this procedure will be ended, and the

continuing actuation will be awaited. In addition, the actuation which moves and

follows a step SP 31 from a step SP 30 will be awaited, without being related to

control in any way in this procedure in CHUNA 2B also in this case.

[0055] In addition, the connection control section 20 will initialize an equipment

list and a connectable list following this, if modification of connection of Bus BUS

is detected by the network interface 18 and it resets each I/O address.

[0056] In the above configuration, in the AV system 1 (drawing 1), if devices,

such as CHUNA2A, are connected to Bus BUS and the power source of an

idling is started, the I/O address of each device connected to Bus BUS will be asked by the network interfaces 11A, 11B, and 18 of this connected device, and I/O addresses AA, AB, and AC which are not set as Bus BUS will be set as each device.

[0057] Moreover, if the condition of Bus BUS is supervised by these network interfaces 11A, 11B, and 18 and connection of Bus BUS is changed, they will reset I/O addresses AA, AB, and AC similarly.

[0058] Thus, where I/O addresses AA, AB, and AC are set up, if power sources, such as CHUNA2A which becomes with a cordless handset, are started, the transmission place address will be set as a default, I/O addresses AA and AB and the attribute information BA and BB on this cordless handset will be sent out to Bus BUS, and these I/O addresses AA and AB and the attribute information BA and BB will be acquired with a main phone 3. The equipment list which list-ized I/O addresses AA and AB and attribute information BA and BB, and was connected to this bus BUS in the main phone 3 by this is created.

[0059] A comparison result is obtained one by one between the attribute information furthermore held at this equipment list, and the attribute information on a monitoring device 3, and the connectable list which list-ized connectable

device relation based on this comparison result is created. Thereby, by the AV system 1, in a main phone, the connection relation of each device is grasped and actuation of each device is controlled by simple connection which only connects Bus BUS according to this grasped connection relation.

[0060] That is, it is set up so that the monitor of the program which CHUNA 2A was controlled to choose a device (monitoring device 3) connectable with this CHUNA 2A from a connectable list if CHUNA 2A is chosen by a user's actuation and a power source is started, and to transmit a video signal and an audio signal to this selected device 3, and this received by CHUNA 2A can be carried out with a monitoring device 3.

[0061] Moreover, this selected device 2A will be controlled, and if the power source of a monitoring device 3 is started, it will be set up so that the monitor of the program which this received by CHUNA 2A can be carried out with a monitoring device 3, so that a device (CHUNA2A or 2B) connectable with this monitoring device 3 may be chosen from a connectable list and a video signal and an audio signal may be transmitted towards a monitoring device 3.

[0062] Also in the monitoring device 3 which does still in this way and controls the whole actuation, if a power source is started, when other main phones are

arranged by sending out attribute information and an I/O address to other

devices in this network, an equipment list and a connectable list can be created

in other main phones.

[0063] In AV system to which various devices, such as CHUNA, a video tape

recorder, and a personal computer, are connected according to a request of a

user by this and which has the remarkably different description from a common

data communication unit, data communication of the connection relation can be

grasped and carried out on a network.

[0064] While sending out attribute information and an I/O address to other

devices in the monitoring device 3 which becomes with a main phone according

to the above configuration, the connection relation between the devices on this

network can be simply grasped by acquiring and list-izing an I/O address and

attribute information from other devices. When this list-izes a connectable device

on the basis of this list, a system can be installed by simple connection which

only connects between each device with a cable.

[0065] (2) Gestalt drawing 5 of the 2nd operation is the block diagram showing

AV system concerning the gestalt of operation of the 2nd of this invention. This

AV system 30 forms a network in one room by CHUNA31A, optical disk unit 32A,

and monitoring device 33A, and forms a network in other rooms by CHUNA31B, optical disk unit 32B, and monitoring device 33B, and connects these two networks with a connector 34.

[0066] At this time, it is made in each network as [constitute /, respectively / optical disk unit 32A, monitoring device 33A, optical disk unit 32B, and monitoring device 33B / ****].

[0067] A connector 34 becomes on the bridge which connects the buses BUS1 and BUS2 of each network. Thereby in the gestalt of this operation, the AV network 30 is made as [arrange / CHUNA, an optical disk unit, and a monitoring device /, respectively / into the buses BUS1 and BUS2 by which a common packet is transmitted / one line at a time].

[0068] Drawing 6 is the block diagram showing the network of the 1st room here. In addition, the duplicate explanation is omitted by becoming with a configuration with the same said of the network of the 2nd room. Moreover, the same configuration as the configuration mentioned above about drawing 1 attaches a corresponding sign, it is shown and the duplicate explanation is omitted.

[0069] In CHUNA 31A of this network, like the case of the gestalt of the 1st operation of a ****, a network interface 35 acquires an I/O address and sends out

the attribute information stored in the attribute information memory 37, and the

I/O address stored in address memory 12A at the time of power-source starting.

Furthermore Bus BUS is supervised, it is between control-section 8A and Bus

BUS, or required data are outputted and inputted between the connection

response section 36 and Bus BUS.

[0070] The connection response section 36 will judge whether corresponding to

this connection request RA, CHUNA 31A is connectable, if a connection request

RA is inputted through a network interface 35. From a main phone, this

connection request RA specifies a data I / O form, and is broadcast by buses

BUS1 and BUS2 here. The connection response section 36 reads the attribute

information BA on CHUNA 2A stored in the attribute information memory 37, and

when the data output format specified using this attribute information BA and the

data I / O form of a connection request RA are in agreement, it judges with

connection being possible. When it judges with furthermore the connection

response section 36 being connectable, the transmission place address of **** is

specified and attribute information and I/O address AA are returned. Thereby,

CHUNA 31A which becomes with a cordless handset in the gestalt of this

operation judges whether according to the demand from ****, it is connectable, is

made as [output / a judgment result], and sends out an I/O address required for control, and attribute information at this time.

[0071] In optical disk unit 32A, the image I/O section 39 is controlled by the control section 40, switches actuation, through a network interface 41, inputs a video signal and an audio signal from Bus BUS, and carries out coding processing of this video signal and audio signal with the coding method suitable for record of an optical disk at the time of record. Furthermore, the image I/O section 39 outputs the coded data obtained by this coding processing to the record playback section 42. On the other hand, at the time of playback, the image I/O section 39 restores to the output signal of the record playback section 42, reproduces a video signal and an audio signal, and sends out this video signal and audio signal through a network interface 41.

[0072] The record playback section 42 is similarly controlled by the control section 40, switches actuation, and reproduces and outputs the coded data recorded on this optical disk to recording the coded data outputted from the image I/O section 39 on an optical disk at the time of playback at the time of record. Thereby, optical disk unit 32A outputs the video signal and audio signal which recorded the video signal and audio signal which are inputted through Bus

BUS on the optical disk, and were reproduced from the optical disk to Bus BUS.

[0073] A network interface 41 is constituted by the I/O circuit which performs the communications processing specified to IEEE1394, acquires I/O address AD like the network interface 35 of CHUNA 2A, and stores this I/O address AD in the address memory 44. In the I/O address stored in the address memory 44 of these optical disk unit 32A and CHUNA 31A, a bus address will be different with the gestalt of this operation in the 1st and 2nd rooms by [which write] having connected buses BUS1 and BUS2 with the connector 34 in carrying out.

[0074] Moreover, a network interface 41 will detect this condition, if the condition of Bus BUS is supervised, for example, which device is separated from Bus BUS. Furthermore based on this detection result, detection processing of I/O address AD is performed anew. Furthermore, a network interface 41 notifies re-detection of this I/O address to the connection detecting element 46.

[0075] A network interface 41 supervises Bus BUS on the basis of this acquired I/O address, if the packet data which specify a self device are sent out on Bus BUS, will incorporate the data of this packet and will output them to a control section 40, the connection control section 47, and connection response section 48 grade.

[0076] Among these, the connection response section 48 will judge whether corresponding to this connection request RD, optical disk unit 32A is connectable, if a connection request RD is inputted through a network interface 41. The connection response section 48 reads the attribute information BD on optical disk unit 32A stored in the attribute information memory 49, and when the data output format specified using this attribute information BD and the data I / O form of a connection request RD are in agreement, it judges with connection being possible here. When it judges with furthermore the connection response section 48 being connectable, the transmission place address of **** is specified and attribute information and I/O address AD are returned. Thereby, like the cordless handset, optical disk unit 32A which becomes by **** in the gestalt of this operation judges whether according to the demand from other ****, it is connectable, is made as [output / a judgment result], and is made as [send / at this time / an I/O address required for control, and attribute information].

[0077] On the other hand, the connection detecting element 46 detects the case where a connection-related setting start condition is satisfied, by detecting the case where the handler of optical disk unit 32A is operated further, when connection of a bus is changed by the notice from a network interface 41 and the

main power supply of optical disk unit 32A is switched on. Furthermore, the

connection detecting element 46 notifies this detection result to the

connection-request section 50 and the connection control section 47.

[0078] The connection-request section 50 sends out the attribute information on

the connectable object stored in the attribute memory 52 for connection, if a

connection-related setup is needed according to the notice of this connection

detecting element 46. At this time, the connection-request section 50 sends out

the I/O address of this optical disk unit 32A collectively, and is made as [return /

a judgment result connectable by this / from each device / towards optical disk

unit 32A].

[0079] The attribute information on a connectable object is prescribed by the

data format of the phase hand-loom machine which can connect this optical disk

unit 32A, and is made here as [correspond / with the data output format of the

attribute information which it comes to hold at the attribute information memory

37 of each device]. By this, the connection-request section 50 asks and carries

out a device connectable with this optical disk unit 32A, for example, when

CHUNA 31A is connectable, an I/O address and attribute information will be

returned from the connection response section 36 of this CHUNA 31A. Moreover,

an I/O address and attribute information will be similarly returned from

monitoring devices 33A and 33B, CHUNA31B, and optical disk unit 32B.

[0080] The connection control section 47 accumulates the I/O address returned

in this way and attribute information in the connectable list memory 54, and

creates the connectable list which becomes by the list of devices connectable

with optical disk unit 32A by this.

[0081] further -- the connection control section 47 -- the demand from a control

section 40 -- or the control command of initiation of operation and the I/O

address of the sending-out place which comes to carry out an optical disk unit at

a sending-out place publish to the most suitable device to creation of this

connectable list further by the demand from other cordless handsets etc.

according to the ranking of the connection which searched the connectable list

succeedingly and was registered into this connectable list. The connection

control section 47 starts the main power supply of optical disk unit 32A if needed

by the data communication between control sections 40, and a video signal and

an audio signal are outputted [thereby] furthermore and inputted between the

most suitable devices following actuation of a user.

[0082] The connection judging section 56 registers connection ranking into a

connectable list according to the demand from the connection control section 47.

In the gestalt of this operation, attribute information and an I/O address are

returned from CHUNA 31A and 31B, optical disk unit 32B, and monitoring

devices 33A and 33B, and suppose that a connectable list is created by these

attribute information and I/O addresses here.

[0083] From this I/O address, the connection judging section 56 sets up

sequential connection ranking from the I/O address with which the address value

approached most, and registers. Thereby, the connection judging section 56

sets up connection ranking so that CHUNA 31A arranged in the same room may

be given priority to and chosen from CHUNA 31B. It is made as [establish / the

most suitable device is chosen if needed and / while grasping the connection

relation between each device / by this, / in the gestalt of this operation, / by

simple installation which only connects a cable, / connection relation].

[0084] Furthermore, when [from which the response of a connectable device is

not obtained at all even if it carries out a case, i.e., predetermined period

progress,] judging a connection device by actuation of this optical disk unit 32A,

for example, attribute information and an equipment list are not stored in the

connectable list at all, the connection judging section 56 drives the information

section 58, and generates warning to a user.

[0085] Drawing 7 is the block diagram showing monitoring device 33A. In this drawing 7 , the same configuration as the configuration mentioned above about the optical disk unit of drawing 6 attaches a corresponding sign, and the explanation which showed and overlapped is omitted. Also in this monitoring device 33A, if I/O address AC is acquired if needed and a connection request RC is inputted from other main phones like optical disk unit 32A, it will judge whether it is connectable. When it can further connect, I/O address AC and attribute information are outputted.

[0086] Furthermore, if a connection-related setup is needed according to the notice of the connection detecting element 46, monitoring device 33A will receive the judgment result of whether for the attribute information on the connectable object stored in the attribute memory 52 for connection to be sent out, and to be able to connect from each device, and will create a connectable list by this judgment result. Furthermore, connection ranking is set as this connectable list by the connection judging section 56.

[0087] Thereby, monitoring device 33A starts the input of a video signal and an audio signal from this CHUNA 31A, after starting CHUNA 31A which it comes to

arrange in the same room according to this connection ranking, when a user

starts a power source and chooses CHUNA.

[0088] If devices, such as CHUNA31A, are connected to buses BUS1 and BUS2

and the power source of an idling is started in the AV system 30 (drawing 5 ,

drawing 6 , drawing 7) in the configuration shown in drawing 6 The I/O address

of each device connected to buses BUS1 and BUS2 is asked by the network

interfaces 35 and 41 of this connected device, and I/O addresses AA, AD, and

AC which are not set as buses BUS1 and BUS2 are set as each device.

[0089] Moreover, if the condition of buses BUS1 and BUS2 is supervised by

these network interfaces 35 and 41 and connection of buses BUS1 and BUS2 is

changed, they will reset I/O addresses AA, AD, and AC similarly.

[0090] Such connection modification of buses BUS1 and BUS2 It combines by

each main phones 32A and 33A and the connection detecting element 46 of ....

Each main phone 32A, When [of 33A and ....] a main power supply is switched

on, it is detected still like the case of each main phones 32A and 33A and ..

where a handler is operated, this detection result is notified to the

connection-request section 50 and the connection control section 47, and

connection-related setting processing is started.

[0091] For example, when connection modification of a bus is detected, this connection modification is detected by each main phone of the 1st and 2nd rooms. Among these, in the 1st monitoring device 33A and optical disk unit 32A of the room, as shown in drawing 8 , it is a step SP 40 and a step SP 41, respectively, and modification of this connection is detected by the connection detecting element 46.

[0092] Thereby, it moves to a step SP 42, and monitoring device 33A sends out the attribute information on the connectable object stored in the attribute memory 52 for connection from the connection-request section 50, and publishes an inquiry whether to be connectable or not to other devices. Moreover, similarly, it moves to a step SP 43 and optical disk unit 32A publishes an inquiry whether it is connectable from the connection-request section 50 to other devices.

[0093] Thereby, monitoring device 33A compares the attribute information it was asked by the connection response section 48 that was the attribute information on self in the continuing step SP 44 following an inquiry of optical disk unit 32A, and judges whether monitoring device 33A is connectable to optical disk unit 32A by this. Furthermore, monitoring device 33A sends out self attribute

information and I/O address to optical disk unit 32A by the connection response section 48 in the continuing step SP 45, when it judges with connection being possible.

[0094] On the other hand, optical disk unit 32A which becomes with the same main phone compares the attribute information it was asked by the connection response section 48 that was the attribute information on self in the continuing step SP 46 following an inquiry of monitoring device 33A, and judges whether optical disk unit 32A is connectable to monitoring device 33A by this. Furthermore, optical disk unit 32A sends out self attribute information and I/O address to monitoring device 33A by the connection response section 48 in the continuing step SP 47, when it judges with connection being possible.

[0095] moreover, in CHUNA 31A which becomes with a cordless handset, in the continuing step SP 48, the attribute information which asked the attribute information on self by the connection response section 48, and was carried out following the inquiry of monitoring device 33A and optical disk unit 32A, respectively is compared, and it judges whether CHUNA 31A is connectable to optical disk unit 32A in whether CHUNA 31A is connectable to monitoring device 33A by this. Furthermore, CHUNA 31A sends out self attribute information and

I/O address to optical disk unit 32A and monitoring device 33A by the connection response section 48 in the continuing step SP 49, respectively, when it judges with connection being possible about each.

[0096] Thereby, by monitoring device 33A, attribute information and an I/O address are acquirable from a connectable device, and after receiving these attributes information and an I/O address in the continuing step SP 50, in a step SP 51, a connectable list is created from such attribute information and an I/O address. Moreover, similarly, attribute information and an I/O address are acquirable from a connectable device, and optical disk unit 32A also creates a connectable list from such attribute information and an I/O address in a step SP 53, after receiving these attributes information and an I/O address in the continuing step SP 52.

[0097] In addition, the ranking of connection is set up and a connectable list is created so that priority may be given to the CHUNA 31A over optical disk unit 32A and it may connect according to the classification of the device contained in attribute information in monitoring device 33A in this case. Thereby, the ranking of connection is set up and it is made as [improve / user-friendliness] so that it may correspond to a user's operating frequency in monitoring device 33A.

[0098] This sets in the gestalt of this operation. Monitoring device 33A CHUNA31A arranged in the 1st room, optical disk unit 32A, CHUNA31B arranged in the 2nd room, Attribute information and an equipment list will be acquired from optical disk unit 32B, and a connectable list will be created. Optical disk unit 32A Attribute information and an equipment list will be acquired from CHUNA31A arranged in the 1st room, monitoring device 33A, CHUNA31B arranged in the 2nd room, optical disk unit 32B, and monitoring device 33A, and a connectable list will be created.

[0099] Thus, when a connectable list is created, by monitoring device 33A, in the continuing step SP 54, a connectable list is accessed by the connection judging section 56, and an I/O address is compared between devices of the same kind. From the comparison result of the step SP55 smell lever which furthermore continues, after setting up and registering sequential connection ranking, it moves from the I/O address with which the address value approached most to the self device to a step SP 56, and this procedure is ended. Thereby, by monitoring device 33A, setting registration of the priority is carried out so that it may give priority and connect with CHUNA31B and optical disk unit 32B which have arranged CHUNA31A of the same room, and optical disk unit 32A in a

different room.

[0100] Similarly, by optical disk unit 32A, in the continuing step SP 57, a connectable list is accessed by the connection judging section 56, and an I/O address is compared between devices of the same kind. From the comparison result of the step SP58 smell lever which furthermore continues, after setting up and registering sequential connection ranking, it moves from the I/O address with which the address value approached most to the self device to a step SP 59, and this procedure is ended. Thereby, by optical disk unit 32A, setting registration of the priority is carried out so that it may give priority and connect with CHUNA31B and monitoring device 33B which have arranged CHUNA31A of the same room, and monitoring device 33A in a different room.

[0101] Further, when [of each main phones 32A and 33A and ....] a main power supply is switched on, when [of each main phones 32A and 33A and ..] a handler is operated, it performs in the main phone with which this the processing of a series of became a candidate for actuation, and a connectable list is created with the main phone which corresponds by this, and setting registration of the connection ranking is carried out.

[0102] This outputs according to this connection ranking and inputs a video

signal and an audio signal between suitable devices in monitoring device 33A etc.

[0103] That is, when the main power supply of monitoring device 33A is switched on as shown in drawing 9 for example, after creating a connectable list in monitoring device 33A, or after the whole actuation is risen by the control section 40 in a step SP 60 in parallel to creation of a connectable list, this connectable list is searched with the continuing step SP 61.

[0104] Then, monitoring device 33A publishes the purport and control command which set monitoring device 33A as the transmission place address, and start sending out of a video signal and an audio signal from the connection ranking of this connectable list to CHUNA 31A in a step SP 62. After receiving this control command in a step SP 63 in CHUNA 31A corresponding to this, the transmission place address is set as the I/O address of monitoring device 33A at the continuing step SP 64, and transmission of a video signal and an audio signal is started.

[0105] Thereby, in a step SP 65, monitoring device 33A starts reception of this video signal and an audio signal, gives priority to it over CHUNA 31B arranged in other rooms, and carries out the monitor of the video signal and audio signal

which received by CHUNA 31A arranged in the same room.

[0106] According to the above configuration, even if it judges whether it is connectable, it sends out attribute information and an I/O address and it creates a connectable list from this sent-out attribute address and an I/O address by the inquiry from a main phone, the same effectiveness as the gestalt of the 1st operation can be acquired.

[0107] By carrying out the sequential comparison of the I/O address of this connectable list furthermore, setting up connection ranking, outputting and inputting a video signal etc. according to this connection ranking, and connecting between devices one by one, by simple connection which connects between each device with a cable, the device which a user needs can be connected preferentially and, thereby, user-friendliness can be improved.

[0108] (3) Gestalt drawing 10 and drawing 11 of the 3rd operation are the block diagram showing AV system applied to the gestalt of the 3rd operation from contrast with drawing 6 and drawing 7 , respectively. This AV system 60 sets up connection ranking by actuation of a handler.

[0109] That is, the handler 65 of a connection setup is arranged, respectively, and in each connection detecting element 67, optical disk unit 62A and

monitoring device 63A notify creation of a connectable list, when the monograph

affair mentioned above about the gestalt of the 2nd operation is satisfied, in

addition also when press actuation of each handler 65 is carried out.

[0110] on the other hand, a cordless handset -- in CHUNA31A and each main

phones 32A and 33A which become by the side, when it has the handler 66 of

priority connection and press actuation of this handler 66 is carried out, to an

inquiry whether to be connectable or not, each connection response section 68

adds the discernment data D1 corresponding to press actuation of a handler 66,

and outputs attribute information and device information.

[0111] In optical disk unit 62A and monitoring device 63A, in case the connection

judging section 69 sets connection ranking as the connectable list created by

this inquiry, it registers the connection ranking of the highest priority to a device

of the same kind about the device by which the discernment data D1

corresponding to press actuation of this handler 66 were added.

[0112] Thereby in the configuration of this drawing 10 and drawing 11 , the

device preferentially connected to each main phone can be registered by simple

actuation which presses the handler 65 of a connection setup, and the handler

66 of priority connection of other devices to coincidence. The connection ranking

which this mentioned above about the gestalt of the 2nd operation can be reset

in order of a request of a user if needed, and, thereby, user-friendliness can be

improved further much more as compared with the gestalt of the 2nd operation.

[0113] (4) Gestalt drawing 12 and drawing 13 of the 4th operation are the block

diagram showing AV system applied to the gestalt of the 4th operation from

contrast with drawing 6 and drawing 7 , respectively. This AV system 70 sets up

connection ranking with a remote commander 75.

[0114] That is, optical disk unit 72A and monitoring device 73A have the remote

control receive section 76, respectively, and in each connection detecting

element 77, if actuation of a remote commander 75 is detected through the

remote control receive section 76 when satisfying the monograph affair

mentioned above about the gestalt of the 2nd operation in addition, they will

notify creation of a connectable list.

[0115] on the other hand, a cordless handset -- in CHUNA71A and each main

phones 72A and 73A which become by the side, if actuation of a remote

commander 75 is detected through the remote control receive section 76 to an

inquiry whether to be connectable or not, each connection response section 78

will add the discernment data D1, and will output attribute information and device

information.

[0116] Connection ranking can be registered so that the remote-operation signal of a remote commander 75 may connect by this the device of the range received by coincidence preferentially in the configuration of this drawing 12 and drawing 13 . The connection ranking mentioned above can be reset on the basis of a remote commander 75 about the gestalt of the 2nd operation by this, and, thereby, user-friendliness can be improved further much more as compared with the gestalt of the 2nd operation.

[0117] (5) it is the gestalt of other operations -- in the above-mentioned gestalt of the 2nd - the 4th operation, although the case where judged whether it is connectable in the reference of a connection request, and it answered was described, from the response not only to this but an inquiry, this invention is inquiry origin and may be judged.

[0118] Moreover, this invention can ask connection according to various conditions not only this but if needed, for example, when connection is required, you may make it ask it in the above-mentioned gestalt of the 2nd - the 4th operation each time, although the case where other devices were asked connection according to conditions -- the main power supply was started -- was

described. If it does in this way, it is not necessary to hold a connectable list and the whole part configuration can be simplified.

[0119] Moreover, in the gestalt of above-mentioned operation, it judges whether it is only connectable to an inquiry, and although the case where it answered was described, this invention may consider working conditions and may answer not only this but if needed. If it does in this way, a working device is already excludable from the candidate for connection.

[0120] Furthermore, although the case where CHUNA, an optical disk unit, and a monitoring device constituted AV system in the gestalt of above-mentioned operation was described, this invention can be widely applied, when various video equipment, such as not only this but a video tape recorder, constitutes AV system.

[0121] Moreover, in the gestalt of above-mentioned operation, although the case where each device was connected to AV system by IEEE1394 with the application of this invention was described, this invention is widely applicable to the audio equipment and the further various communication network devices which constitute an audio system not only by this but by various serial interface and a parallel interface.

[0122]

[Effect of the Invention] Information signals various between corresponding

devices can be sent and received, and, according to this invention, thereby,

installation of a device can be simplified only by connecting a cable as

mentioned above by sending and receiving the information and the I/O address

which show the attribute of each device, and judging whether based on this

attribute information, it is connectable.

[0123] Moreover, based on this attribute information etc., by setting up

connection ranking, priority can be given to the device of the same room etc., it

can connect, and user-friendliness can be improved at this time.

[Translation done.]

2.**** shows the word which can not be translated.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing AV system concerning the gestalt of operation of the 1st of this invention.

[Drawing 2] It is the abbreviation diagram showing the packet applied to AV system of drawing 1 .

[Drawing 3] It is the timing diagram with which explanation of actuation of AV system of drawing 1 is presented.

[Drawing 4] It is the timing diagram with which explanation of actuation following drawing 3 is presented.

[Drawing 5] It is the block diagram showing AV system concerning the gestalt of operation of the 2nd of this invention.

[Drawing 6] It is the block diagram showing CHUNA of AV system of drawing 5 , and the detail configuration of an optical disk unit.

[Drawing 7] It is the block diagram showing the detail configuration of the

monitoring device of AV system of drawing 5 .

[Drawing 8] It is the timing diagram with which explanation of actuation of AV system of drawing 5 is presented.

[Drawing 9] It is the timing diagram with which explanation of actuation following drawing 8 is presented.

[Drawing 10] It is the block diagram showing CHUNA and the detail configuration of an optical disk unit about AV system concerning the gestalt of operation of the 3rd of this invention.

[Drawing 11] It is the block diagram showing the detail configuration of the monitoring device of AV system of drawing 10 .

[Drawing 12] It is the block diagram showing CHUNA and the detail configuration of an optical disk unit about AV system concerning the gestalt of operation of the 4th of this invention.

[Drawing 13] It is the block diagram showing the detail configuration of the monitoring device of AV system of drawing 12 .

[Description of Notations]

1, 30, 60, 70 .... AV system, 2A, 2B, 31A, 31B, 61A, 71A .... CHUNA, 3, 33A, 33B, 63A, 73A .. Monitoring device, 4 75 .... A remote commander, 8A, 8B, 16,

40 .. Control section,

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CLAIMS

[Claim(s)]

[Claim 1] (a) The data transmission line which can connect, can detach the

device for AV (14) freely suitably, and can set topology automatically, and is

shared by transmission of AV data and control data (16), (b) The device for AV

which contains the command for controlling the device itself and is connected to

said data transmission line (16) (14), and (c) -- the command, while downloading

a command from said device for AV (14) through said data transmission line (16)

AV system characterized by having centralized-control equipment (12) which

outputs to said device for AV (14) through said data transmission line (16), and

controls said device for AV (14).

[Claim 2] Said data transmission line (16) is an AV system according to claim 1 characterized by being the data transmission line based on IEEE1394.

[Claim 3] Said centralized-control equipment (12) is an AV system according to claim 1 or 2 characterized by downloading a command from the device for AV (14), and overwriting the memory for commands which can be written at the time of the need for control of said device for AV (14).

[Claim 4] Said device for AV (14) is an AV system according to claim 1 to 3 which contains the icon source and the GUI source and is characterized by said centralized-control equipment (12) downloading the icon source and the GUI source for using it for a display to a user in case a user chooses processing through said data transmission line (16) from the device for AV (14).

[Claim 5] AV system according to claim 1 to 4 characterized by having the wireless actuation machine (26) with which data are sent and received between said centralized-control equipment (12), and a user chooses processing.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to AV system which controls two or

more devices for AV (audio video) by predetermined centralized-control

equipment.

[0002]

[Description of the Prior Art] In AV system, when two or more devices for AV,

such as a CD player, are connected to amplifier by AV cable, for example, it

dubs the music of CD to a cassette tape, a user turns ON amplifier, a CD player,

and a cassette tape recorder, and is operating the play switch of a CD player,

and the sound recording switch of a cassette tape recorder. In this case, a user

needs to operate it in the place of each device for AV, and actuation becomes

complicated.

[0003] on the other hand, amplifier -- a nucleus -- carrying out -- every -- while

connecting the device for AV, and amplifier by AV cable, it ties in a control line

and there is an AV system which can perform all actuation from the place of

amplifier (centralized control) and which was made like.

[0004]

[Problem(s) to be Solved by the Invention] The trouble of the conventional

centralized control of AV system is as follows.

(a) Centralized-control equipment needs to equip ROM with the control program

of the device for AV beforehand, and cannot add the control program which has

not equipped the control program later.

(b) Since centralized-control equipment will equip the control program of all the

devices for AV of AV system, the amount of memory of the control program in

centralized-control equipment increases.

[0005] The purpose of this invention is offering AV system which conquered the

above-mentioned trouble.

[0006]

[Means for Solving the Problem] AV system (10) of this invention has following (a) - (c).

(a) Connect the device for AV (14) suitably. The device for AV (14) which contains the command for controlling the data-transmission-line (16) (b) device itself which can detach freely, and can set topology automatically and is shared by transmission of AV data and control data, and is connected to the data transmission line (16), and (c) data transmission line (16) are minded. the device for AV -- (centralized-control equipment (12 [0007] which outputs the command to the device for AV (14) through the data transmission line (16), and controls the device for AV (14) while downloading a command from 14)) AV data mean audio data and/or a video data. That is, only audio data may mean only a video data and AV data may mean both data.

[0008] Each device for AV (14) contains the command for controlling it, and to the data transmission line (16), suitably, it can connect and it can detach it freely. every by which the device for AV (14) connected to the data transmission line (16) is detected by automatic setting of topology, and centralized-control equipment (12) is connected to the data transmission line (16) -- while

downloading the command of the device for AV (14) through the data

transmission line (16), the command is published to the device for AV (14)

through the data transmission line (16), and the device for AV (14) can be

controlled. Thus, even if centralized-control equipment (12) has not equipped

beforehand the control program of the device for AV (14) newly added, it can

carry out centralized control of the device for AV (14) added convenient.

Moreover, the command of each device for AV (14) may be incompatible

between the devices for AV (14).

[0009] According to other AV systems (10) of this invention, the data

transmission line (16) is the data transmission line based on IEEE1394 further.

[0010] The data transmission line (16) based on IEEE1394 possesses all the

conditions of being able to use in common to transmission of that can connect

and the device for (a) AV (14) can be detached freely suitably, that (b) topology

can be set automatically, (c) AV data, and control data.

[0011] According to other AV systems (10) of this invention, further, at the time of

the need for control of the device for AV (14), centralized-control equipment (12)

downloads a command from that device for AV (14), and overwrites the memory

for commands which can be written.

[0012] Centralized-control equipment (12) needs to equip memory with no command of the devices for AV (14) at once, whenever it is processing, it downloads the command of the device for AV in connection with the processing (14), overwrites memory, and can reduce the capacity of memory.

[0013] According to other AV systems (10) of this invention, further, the device for AV (14) contains the icon source and the GUI source, and centralized-control equipment (12) downloads the icon source and the GUI source for using it for a display to a user in case a user chooses processing through the data transmission line (16) from that device for AV (14).

[0014] GUI (graphical user interface) is desired when a user chooses processing in centralized-control equipment (12). Each device for AV (14) contains the icon source and the GUI source which are shown with the icon showing processings (example: in the case of a cassette tape recorder playback, a halt, a rapid traverse, etc.) of the device for AV (14) itself and its device for AV (14), a graphic form, etc., and the icon source and the GUI source download it to centralized-control equipment (12), and it is used for a display to a user in case a user chooses processing. Thereby, even if centralized-control equipment (12) has not equipped beforehand the icon source and the GUI source in connection

with the device for AV (14) added newly, it can perform the display of the icon

and GUI in connection with the device for AV (14) convenient.

[0015] Other AV systems (10) of this invention have the wireless actuation

machine (26) with which data are sent and received between centralized-control

equipment (12), and a user chooses processing further.

[0016] A user can direct processing through a wireless actuation machine (26),

without going out one by one to the place of centralized-control equipment (12).

[0017]

[Embodiment of the Invention] Hereafter, the gestalt of implementation of this

invention is explained with reference to a drawing. Drawing 1 is the block

diagram of the AV system 10 a user instructs processing to be with a pointing

device 22. Serial connection of the centralized-control machine 12 and two or

more devices 14 for AV is made through the IEEE1394 bus 16. By IEEE1394

bus 16, since the number of a connection device is to a maximum of 63 and the

centralized-control machine 12 takes the node number of one piece, the

connection number of the device 14 for AV becomes a maximum of 62. A

monitor 18 receives data from the centralized-control machine 12 through the

usual cable 20. A pointing device 22 is operated by the user, is equivalent to the

pointing device of a personal computer, has a manual operation button for migration of the cursor of the screen of a monitor 18, a click, etc., and is connected to the centralized-control machine 12 by wireless. The actuation of a user in a pointing device 22 is sent to the centralized-control machine 12. The centralized-control machine 12 changes into an analog AV signal the data stream of AV signal inputted through the IEEE1394 bus 16, and the output of it is attained through the cable 24 at the loudspeaker with amplifier etc. When the loudspeaker has equipped the IEEE1394 interface, as a device 14 for AV, direct connection is made into the IEEE1394 bus 16, and the packet data of Av signal can be directly received from the centralized-control machine 12 or other devices 14 for AV.

[0018] Drawing 2 is the block diagram of the AV system 10 a user instructs processing to be with the wireless liquid crystal remote control 26. Only difference with drawing 1 is explained. The wireless liquid crystal remote control 26 is connected to the centralized-control machine 12 by wireless, and data are sent and received between the centralized-control machine 12 and the wireless liquid crystal remote control 26.

[0019] Drawing 3 is the block diagram of the wireless liquid crystal remote

control 26. The data from the centralized-control machine 12 are inputted into transmission and a receiver 28, and are displayed on a drop 32 through the depiction virtual unit 30. In the case of a touch panel, an input device 34 serves as an indicator 32, it is changed into a digital signal, and further, it is sent to A-D converter 36, and it is sent [the analog signal in connection with the touch part of a user's finger is sent to the input location converter 38, and transmission and a receiver 28, and] to the centralized-control machine 12 from transmission and a receiver 28.

[0020] Drawing 4 shows the relation between the virtual display rectangle 40 and the actual display screen 42 of a drop 32. The virtual display rectangle 40 has predetermined die length to the X-axis and Y shaft orientations, and the predetermined rectangle range of the virtual display rectangles 40 is actually displayed on a drop 32 as the display screen 42. The display screen 42 is actually freely movable within the limits of the virtual display rectangle 40.

[0021] Drawing 5 shows addressing of IEEE1394. The address is 64 bit length and 10 bits of the beginning have become a bus number and the space where, as for the following 6 bits, each node can use 48 bits of a node number and low order freely.

[0022] Drawing 6 shows the low order 48 bit-address space in each

centralized-control machine 12. This address space is recording the information

concerning the icon of a sake in case each device 14 for AV chooses the

processing which requires a user for that device 14 for AV, GUI, and a command.

The address is expressed with 12 figures of hexadecimals, and each data is

recorded on each address like drawing 6 . Since each device 14 for AV defines a

command according to an individual, it does not need to have other devices 14

for AV and compatibility about a command.

[0023] Drawing 7 and drawing 8 are each partial diagrammatic view which

divided the flow chart to the display in the wireless liquid crystal remote control

26, and actuation of a user up and down. In drawing 7 , pass initialization (S50)

is automatically performed, when the power source of the centralized-control

machine 12 and the device 14 for AV is turned on and a new node is added, and

when a node is deleted, and topology is set automatically. Until it registers into

the centralized-control machine 12 the icon of all the devices 14 for AV

connected to the IEEE1394 bus 16 (S52) The source of an icon is led through

the IEEE1394 bus 16 from each device 14 (node) for AV (= download). It is

divided into icon source data and GUI source address data (S56), it registers

with the icon table (drawing 10) of the centralized-control machine 12 (S58), and the source data of an icon are sent to the wireless liquid crystal remote control 26 (S60). With the wireless liquid crystal remote control 26, an icon is plotted based on the sent source data of an icon (S62).

[0024] In drawing 8 , if a user corrects the location of the icon on the wireless liquid crystal remote control 26 by manual input (S66) (S64), based on the correction, the icon table (icon locations X and Y of the node of drawing 10) of the centralized-control machine 12 will be corrected (S68). Investigate in the demand of an icon, or the demand of GUI, and if the actuation input is the demand of GUI in S74 when the existence of the input from a user is investigated and a user inputs manually by S70 (S72), by S76 the input positional information of manual input to a GUI table (drawing 12) -- referring to -- a command -- publishing (a command being sent to the target device 14 for AV through the IEEE1394 bus 16) -- The following GUI source address is determined and the GUI source is led from the device 14 for AV (download). The downloaded GUI source is divided into GUI source data and GUI source address data, a GUI table is created and corrected by S80, the source data of GUI are transmitted to the wireless liquid crystal remote control 26 from the

centralized-control machine 12 by S82, and GUI is plotted in the wireless liquid

crystal remote control 26 by S84 S78.

[0025] Drawing 9 shows the address of the icon table in the centralized-control

machine 12. Drawing 10 shows the contents of each address of drawing 9 .

Drawing 11 actually indicates the relation between the icon 44 on the display

screen 42, and icon space to be each contents of drawing 10 . The address of

the command corresponding to X coordinate in case the icon of each node 12,

i.e., a centralized-control machine, and the device 14 for AV is arranged in the

virtual display rectangle 40 of the wireless liquid crystal remote control 26 and Y

coordinate, and an icon 44, and the storing address of the source of each icon

44 are recorded on the icon table.

[0026] Drawing 12 shows the contents of the GUI command table in the

centralized-control machine 12. The GUI command table is recording the

address of the X coordinate of each GUI command in a GUI screen, Y

coordinate, and each GUI command. The command group of drawing 12 and the

command group of drawing 13 have pointed out the same thing.

[0027] Drawing 13 shows the relation between an icon screen and a GUI screen,

and data. This AV system 10 shifts to the GUI screen of the depths one by one

until a command selection screen begins from an icon screen at first, chooses a

sub menu or a command on each GUI screen by choosing a command in a

pop-up format and it reaches a command (it is the same as the select command

method of Windows of a personal computer OS.). On an icon screen, while

plotting the icon on an icon screen with reference to the icon source and a

command from an icon table, it prepares for the command executed when an

icon is chosen. Similarly, on a GUI screen, while plotting GUI on a GUI screen

with reference to a command group (settlement of two or more commands) from

a GUi icon table, it prepares for the command executed when a command menu

is chosen.

[0028] Drawing 14 - drawing 21 are the division Figs. of the flow chart of the

processing between both in the processing list in the centralized-control machine

12 and the wireless liquid crystal remote control 26. Left-hand side and

right-hand side have been processing in the wireless liquid crystal remote

control 26 and the centralized-control machine 12 to the boundary line 90,

respectively. When initialized in drawing 14 (S92), the number of nodes

connected from the topology map is investigated by S94, and it is the

centralized-control machine 12 (in this flow chart) at S96. the centralized-control

machine 12 -- AV It is referred to as Master. *icon address of each node number

and each node (* shall mean not the contents of memory but the address of

memory) from -- each icon source and an icon command table (the icon

command table is having illustration omitted in drawing 6) It leads (download)

and it is memorized by S98 to the icon space (single-tier table on the right of

drawing 11) of the centralized-control machine 12. In S100, the storage icon

source of an icon table is sent to the wireless liquid crystal remote control 26.

[0029] In drawing 16 , in order to cope with manual input in the wireless liquid

crystal remote control 26, based on the icon source from the centralized-control

machine 12, processing which displays an icon on the drop 32 of the wireless

liquid crystal remote control 26 is performed. By S116, a new icon is plotted, an

icon plot location is suitably changed by the user and a final icon plot location is

transmitted to the centralized-control machine 12 by S118 S120. If a user

chooses a predetermined icon by S112, the input positional information X and Y

will be transmitted to the centralized-control machine 12 by S124.

[0030] In drawing 15 , the icon locations X and Y of an icon table (drawing 10)

are updated by S126 based on the icon plot location transmitted from the

wireless liquid crystal remote controlS118 of 26. Moreover, in S128, the input

positional information X and Y sent from the wireless liquid crystal remote

controlS124 of 26 is recorded in an actuation input register. The icon which

whether the actuation input register of S128 was updated judged in S102, and

the user chose by S104 based on the icon locations X and Y of an icon table

(drawing 10) when updated, i.e., a node, (directions node.) = The device 14 for

Directions AV judges either. If an output instruction is in the command of the

command table of the directions node (S106), an instruction will be outputted to

a directions node (S108), and if the command of the command table of the

directions node has a GUI lead instruction (S110), it will progress to S130 of

drawing 14 .

[0031] In drawing 17 , by S130, the next address (*GUI_1_GUI) of the icon

source of drawing 6 and the ending address of an icon command (the icon

command is omitted in drawing 6 .) is led from a directions node (download), and

the magnitude (GUI_1_S_Length) of the GUI source of GUI (1) is got to know. At

S132, it is *GUI_1_GUI++ (it means that + adds +1.). moreover, drawing 6 --

setting -- N N of Byt is set as 1. from -- GUI_1_S_Length length (1), i.e., GUI, is

led (download). By S134, GUI (1) is transmitted to a drop 32. The GUI_C_Table

value which asks for the sum of GUI_1_S_Length, *GUI_1_GUI, and 2, and

expresses the command table length of address:*GUI_C_Table (1) equal to the number, i.e., GUI, with S136 is led. In addition, in S146, a user's actuation input positional information transmitted to the centralized-control machine 12 from the wireless liquid crystal remote control 26 in S144 (it sets to drawing 18 and is the after-mentioned) is recorded in an actuation input register.

[0032] In drawing 18 , based on the GUI source of GUI (1) transmitted to the wireless liquid crystal remote control 26 from the centralized-control machine 12 in the above-mentioned S134, an icon screen is changed to a GUI screen and GUI (1) is described by S140 by manual input of a user in a drop 32. If a user performs a predetermined actuation input to the GUI screen of GU1 (1), the input positional information X and Y will be transmitted to the centralized-control machine 12 from the wireless liquid crystal remote control 26 by S144.S142.

[0033] Only the GUI_C_Table value led in S136 by S148 in drawing 19 is address:*GUI_C_Table++ (it means that + adds +1.). That is, close [of a GUI_C_Table value] is led from the next address of the address which was (download), and it is memorized by S150 to the GUI command table space (the command table of drawing 13 , and room of a command group) of the centralized-control machine 12. In S152, since it investigated whether it would

be in agreement with the input location of a GUI command table in S154, the

actuation input register was cleared in S156 in the case of the inequality and the

command was specified in coincidence noting that the actuation input register

was updated, when new input positional information was recorded in the

actuation input register in the above-mentioned S146, it progresses to S158 of

drawing 20 .

[0034] In drawing 20 , the output instruction corresponding to the input specified

by the user is carried out by S158. This instruction is outputted to the node 14 in

connection with this, i.e., the device for AV, through the IEEE1394 bus 16. If it

judges whether it is necessary to display the next GUI screen by S160 and there

is need, by S162, the address of the following GUI source is calculated based on

the offset value from GUI_C_Table and *GUI_C_Table described by the GUI

command table (drawing 12), and the GUI source of the address is led

(download). In S164, the led GUI source is transmitted to the wireless liquid

crystal remote control 26, and a GUI command table is led in S166 (download).

[0035] In drawing 21 , the GUI command table led by S166 is memorized to the

GUI command table space of the centralized-control machine 12 by S168. If

S170 and S172 are directions which process like the above-mentioned S152

and S154, and will return to return and the first icon screen S158 if in agreement,

they will return to S100.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is AV structure-of-a-system Fig. where a user directs processing

with a pointing device.

[Drawing 2] It is AV structure-of-a-system Fig. where a user directs processing

with wireless liquid crystal remote control.

[Drawing 3] It is the block diagram of wireless liquid crystal remote co

[Drawing 4] It is drawing showing the relation between a virtual display recta
and the actual display screen of a drop.

[Drawing 5] It is drawing showing addressing of IEEE1394.

[Drawing 6] It is drawing showing the low order 48 bit-address space in each
centralized-control machine.

[Drawing 7] It is the up part Fig. which divided the flow chart to the display in
wireless liquid crystal remote control, and actuation of a user up and down.

[Drawing 8] It is the lower part Fig. which divided the flow chart to the display in
wireless liquid crystal remote control, and actuation of a user up and down.

[Drawing 9] It is drawing showing the address of the icon table in a
centralized-control machine.

[Drawing 10] It is drawing showing the contents of each address of drawing 9 .

[Drawing 11] It is drawing actually showing the relation between the icon on the
display screen, and icon space with each contents of drawing 10 .

[Drawing 12] It is drawing showing the contents of the GUI command table in a
centralized-control machine.

[Drawing 13] It is drawing showing the relation between an icon screen and a GUI screen, and data.

[Drawing 14] It is the partial diagrammatic view which divided the flow chart of processing between both into the processing list in a centralized-control machine and wireless liquid crystal remote control.

[Drawing 15] It is the partial diagrammatic view which divided the flow chart of processing between both into the processing list in a centralized-control machine and wireless liquid crystal remote control.

[Drawing 16] It is the partial diagrammatic view which divided the flow chart of processing between both into the processing list in a centralized-control machine and wireless liquid crystal remote control.

[Drawing 17] It is the partial diagrammatic view which divided the flow chart of processing between both into the processing list in a centralized-control machine and wireless liquid crystal remote control.

[Drawing 18] It is the partial diagrammatic view which divided the flow chart of processing between both into the processing list in a centralized-control machine and wireless liquid crystal remote control.

[Drawing 19] It is the partial diagrammatic view which divided the flow chart of

processing between both into the processing list in a centralized-control machine

and wireless liquid crystal remote control.

[Drawing 20] It is the partial diagrammatic view which divided the flow chart of

processing between both into the processing list in a centralized-control machine

and wireless liquid crystal remote control.

[Drawing 21] It is the partial diagrammatic view which divided the flow chart of

processing between both into the processing list in a centralized-control machine

and wireless liquid crystal remote control.

[Description of Notations]

10 AV System

12 Centralized-Control Machine

14 Device for AV

16 IEEE1394 Bus (Data Transmission Line)

26 Wireless Liquid Crystal Remote Control (Wireless Actuation Machine)

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] With the control system which controls systematically two or more

object-ized peripheral devices by one controller through a common

communication line, ******, Said controller and said two or more peripheral

devices have the bidirection interface transmit and receive data bidirectionally to

said communication line, respectively. To said each peripheral device The object

data about control of the function are stored beforehand, respectively. When it

connects with said peripheral device through said communication line, while said

controller loads said object data from this peripheral device and forms the object

corresponding to said peripheral device The actuation screen for operating said peripheral device based on these object data is displayed under the control by the side of said controller. The system control station which is constituted and becomes so that the command by the side of said controller may be outputted to said communication line through said object and said peripheral device may be controlled according to the actuation based on said actuation screen by the side of said controller.

[Claim 2] It is the system control station characterized by having the message transceiver means for said object-ized peripheral device and said controller transmitting and receiving messages, such as control instruction and data input/output instruction, mutually in claim 1.

[Claim 3] It is the system control station which comes to have method groups, such as the activation procedure and the function with which said object-ized peripheral device and said controller are specified by said message in claim 1, and a subroutine, and an execution environment of those.

[Claim 4] It is the system control station characterized by being encapsulated so that said peripheral device and controller which were object-ized may conceal in-house datas, such as an internal state and a variable parameter, inside in

claim 1 and the in-house data may be indirectly accessed by calling a method.

[Claim 5] It is the system control station which comes for said object-ized peripheral device to have a means to hold a control panel, a display, etc. as a graphical user interface, and to send out the graphical user interface to an external controller so that own actuation and an own display can be performed by the external controller in claim 1.

[Claim 6] It is the system control station which has the table which defined the method on claim 5 and corresponding to actuation of the control panel of said graphical user interface in said object-ized peripheral device, and comes to have a means to send out the table to an external controller.

[Claim 7] It is the system control station which has a means for said object-ized peripheral device to pack a graphical user interface and a method definition table in claim 6, to realize as an object, and to send out the object to an external controller.

[Claim 8] It is the system control station which has a means to realize by the predetermined description language into which said object-ized peripheral device packed the graphical user interface and the method definition table in claim 6, and to send out the description language to an external controller.

[Claim 9] Said controller is a system control station which comes to have a display means in the physical-connection condition of a peripheral device that plurality was object-ized in claim 1.

[Claim 10] Said controller is a system control station which comes to have the display means and modification means of operating state of a peripheral device which plurality was object-ized in claim 1.

[Translation done.]

* NOTICES *

Japan Patent Office is not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention is used for the system control of the multimedia device dealing with various information, such as an alphabetic character, voice, a still picture, and an animation, and is suitable.

[0002]

[Description of the Prior Art] In AV equipments, such as an audio video, TV, etc. centering on analog technology, digitization is progressing quickly in recent years conventionally. Moreover, together with the spread of digitizations of an alphabetic character and still picture information, an alphabetic character, voice, a still picture, and animation information have come to be dealt with in generalization in a computer as the so-called multimedia.

[0003]

[Problem(s) to be Solved by the Invention] However, when the present multimedia devices (voice-input/output devices, such as a digital camera, a CD-ROM player, a scanner, a sound board, and a video board, image input/output equipment, etc.) were used by computer, software called the application software or the device driver of dedication which drives it had to be

installed in the computer.

[0004] therefore, a multimedia device new by this approach -- receiving -- new application software or a new device driver -- every computer -- or since there was nothing if it does not prepare for every OS (Operating System), the development load of software was large and there was a problem that high-speed control was efficiently impossible.

[0005] Moreover, the concept of the multi-media system which can access each peripheral device from each computer through LAN by this approach since that multimedia device cannot be used transparent from other computers generally connected to LAN cannot be realized, and it is ******.

[0006]

[Means for Solving the Problem] The place by which it was made in order that this invention might solve an above-mentioned technical problem, and it is characterized [the] With the control system which controls systematically two or more object-ized peripheral devices by one controller through a common communication line, ******, Said controller and said two or more peripheral devices have the bidirection interface transmit and receive data bidirectionally to said communication line, respectively. To said each peripheral device The object

data about control of the function are stored beforehand, respectively. When it connects with said peripheral device through said communication line, while said controller loads said object data from this peripheral device and forms the object corresponding to said peripheral device The actuation screen for operating said peripheral device based on these object data is displayed under the control by the side of said controller. According to the actuation based on said actuation screen by the side of said controller, the command by the side of said controller is outputted to said communication line through said object, and it is in the system control station which is constituted and becomes so that said peripheral device may be controlled.

[0007]

[Function] The environment where therefore do not need special software, such as the above-mentioned application software and a device driver, in control of a multimedia device, and a multimedia device is operated from other controllers in common transparent through LAN to this is realizable.

[0008]

[Example] The example of this invention is explained to a detail below, referring to each drawing.

[0009] First, by this invention, a multimedia device is separately regarded as an object and the controller uses the system control technique of managing those objects integrative.

[0010] Since each object is managed by the controller, it has the function to send out function / control means which self has to a controller. Control is realizable only by it becoming unnecessary to prepare this a control program beforehand like former therefore at a controller side, and connecting with a controller at it.

[0011] Moreover, the flexibility and expandability that it can respond without the controller's having the means for making it display and operate it to human being who actually directs control for the above-mentioned control means sent from the object connected, and a controller's being able to manage a multimedia device now intensively therefore to this, and making new preparations also to a new multimedia device are realizable.

[0012] in addition, the object-oriented concept itself used for this invention -- for example, "Ishizuka : -- object oriented programming, ASCII publication, and 1988. " -- "Sakai : A guide to object-oriented, Ohm-Sha, and 1990. " -- " -- B.J. cox : Programming of object-oriented, TOPPAN, and 1988. " -- etc. -- since it is explained to bibliography in detail, in explanation of an example, fundamental

technical explanation is omitted to the following this inventions.

[0013] Being able to utilize it also for OS or a multimedia database widely further, although this object-oriented attracts attention in the viewpoint of the increase in efficiency of programming development environment in recent years, especially a concept characteristic at object-oriented is (1). Capsulation (2) Succession (3) It is in three points of messaging, and based on these concepts, this invention aims at development and an escape so that it can apply to control of a multimedia device.

[0014] Drawing 1 shows the logical topology of the multimedia controller which took in the object-oriented concept of this invention, and a multimedia device. Centering on the multimedia controller of 1, the channel is established so that the direct dialogue of various information can be performed by 1 to 1, and each multimedia device of 2 controls by communicating a message mutually through the channel, respectively. The multimedia device is aimed concrete at devices which deal with all multimedia data, such as OA equipment, such as AV equipments, such as CD player digital VTR and digital camera digital TV, and digital FAX, a digital copy machine, a printer.

[0015] Moreover, Dedication OS and application software can be carried on the

general purpose computer of a personal computer or a word processor WS, and a controller can also be realized, although the device of dedication is assumed here.

[0016] Next, it is (a) about the physical-connection gestalt for the establishment of the bidirection channel of a multimedia controller and a multimedia device to drawing 2 . - (c) It is shown.

[0017] This drawing (a) About the daisy chain connection type adopted by SCSI bus (ANSI X 3.131-1986), it is this drawing (b). About the star mold connection type adopted by Ethernet (IEEE 802.3) 10BaseT, it is this drawing (c). The tandem-type connection type adopted by Ethernet 10Base 2/5 is shown, respectively.

[0018] moreover, (a) like [in a topology] GPIB (IEEE 488) - (c) a mixed method and Ethernet -- (b) , (c) There is a mixed method. Moreover, the various combination and the selections besides drawing 2 can do the method with which a communication mode also uses an optical cable and ISDN.

[0019] In this invention, the establishment approach of the channel of this bidirection or which are chosen does not especially make reference. however, physical limits (a transfer rate, the number of connection, connection die length,

connector configuration, etc.) by the difference in a communication mode

although it does not become a problem since the hierarchy of a protocol is

different in the two-way communication of a message, in order to perform mutual

connection of a peripheral device certainly -- one kind of minimum -- being

physical (a mechanism ---like and electric) -- it is necessary to have a common

interface

[0020] Moreover, although the approach using optical communication, such as

FDDI (Fiber Distributed Data Interface) more nearly high-speed than Ethernet

and B-ISDN, can be considered in order to realize high-speed data

communication like a dynamic image, explanation will be advanced here as what

has Ethernet 10Base2 (/T) which is cheap and has spread for explanation as a

common communication link connector.

[0021] Next, the internal-block Fig. in the hardware side of a common multimedia

device is shown in drawing 3 .

[0022] Two or more multimedia devices are connected with the controller

through LAN of 4, respectively. Now LAN Since it is Ethernet, the interface

section 20 which processes the communications protocol (TCP/IP) is formed.

this -- dedication LSI etc. -- it is realizable by use. Here, the sent message itself

is taken out or a message is sent out conversely to a controller. As an example

of a message, a general form is expressed below at Objective-C.

[0023] [-- object object method name: -- although expressions differ in language

besides argument], it is fundamentally the same and the following assignment is

performed.

[0024] (1) assignment (2) of an object object Method (processing to perform)

Assignment (3) Argument (parameter) if it is -- that **** -- the flow of the software

of drawing 3 explains the handling of this message.

[0025] CPU of 11 which performs all software processing and hardware control

in the interior of a multimedia device through the internal bus of 10, ROM of 12 in

which a program, initial value, and proper information were stored, and RAM of

13 used as a work-piece field on the occasion of program execution in storing

internal parameters, such as a transient data and a device condition, ****, Data

I/O of 14 which accesses the multimedia data of 15 stored in the internal medium

or the external medium, There are a mechanism system mechanical component

of 16 which controls device parts, such as a motor of 17, and an electric system

mechanical component of 18 which controls the electric part of display systems,

such as the switch SW of 19 and LED. moreover -- although the multimedia data

of 15 are a part in which digital data, such as an image, voice, and an alphabetic character, are stored -- optical disks, and DCC and DAT, such as CD-ROM and MD, etc. -- there may be various gestalten, such as a magnetic tape medium or a semi-conductor memory card.

[0026] Next, the internal-block Fig. in the hardware side of a multimedia controller is shown in drawing 4 . In this drawing, it connects with the multimedia device through LAN of 4. Now, since LAN is Ethernet, it has the interface section 31 which processes the communications protocol (TCP/IP). This is realizable by use of Dedication LSI etc. The message itself sent here is taken out or a message is sent out conversely to a multimedia device.

[0027] Through the internal bus of 30, internal parameters, such as CPU of 21 which performs all software processing and hardware control, ROM of 22 in which a program, initial value, and proper information were stored, and a transient data, a device condition, are stored in the interior of a multimedia controller, or there is RAM of 23 used as a work-piece field on the occasion of program execution in it. The multimedia filing equipment of 25 is not based on any of an internal medium or an external medium, but performs storing, retrieval, playback, edit, etc. of multimedia data. There are an electric system mechanical

component of 28 by which data I/O of 24 performs the access control, and it controls the electric part of display systems, such as the switch SW of 29 and LED, a display of 27 for constituting a man machine interface, a display controller of 26 which performs the display control, and pointing devices, such as a mouse which is not illustrated.

[0028] Drawing 6 shows the system-hierarchy Fig. in the software side of a multimedia device. The internal-block Fig. shown by drawing 3 hits the hardware of 57. OS of 58 performs fundamental control for controlling such hardware. Although especially the OS itself is not limited, it is desirable to have the function of the multitasking which performs two or more programs in parallel to real time nature and coincidence with one. On this OS, in order to realize object-ization of a multimedia device, it has the class library 59 of a proper for every multimedia device.

[0029] Moreover, although not illustrated, it has a library about the self control panel and control for being controlled from a controller, and control of a multimedia device proper is realized from a controller side by transmitting this at the time of a controller and connection. Moreover, there is a C function 60 which performs a timer and arithmetic operation.

[0030] The top hierarchy has the application software of 61 which takes charge of control of the body of a multimedia device, the communication link with a multimedia controller, and a user interface. With this application, the body of a multimedia device can perform control and activation various by the exchange of a message from a controller as one object, and as an instance variable, a readout is performed and an internal parameter can make a change.

[0031] Drawing 5 shows the system-hierarchy Fig. in the software side of a multimedia controller. The internal-block Fig. shown by drawing 4 hits the hardware of 50. OS of 51 performs fundamental control for controlling such hardware. Although especially the OS itself is not limited here, it is desirable to have the function of real time nature and multitasking with ones.

[0032] Window Server of 52 which performs GUI (Graphical Users Interface) at large [, such as a display of the control screen of two or more multimedia devices connected on this OS, a display of the whole system connection condition, and a change of control and data I/O,] It is. The components group [that it is fundamental and-like in common] (object group) about user interfaces, such as a carbon button, slide volume, and text display area, and control which have prepared the common class library of 53 by the controller side beforehand is

stored.

[0033] Conversely, the components group (object group) about a panel display and control of the multimedia device proper to which the proper class library of 55 is connected is stored. It is sent from that device and this proper library increases, whenever a multimedia device is connected to a system, as explained previously. These concrete procedures are mentioned later. Moreover, there is a C function 54 which performs a timer and arithmetic operation. The top hierarchy has the application software of 56 which takes charge of control of the whole multimedia device connected, the communication link with a multimedia device, and a user interface.

[0034] This controller, a concrete control flow between multimedia devices, and the exchange of a message are explained after this.

[0035] Drawing 7 is drawing showing the condition before connecting a multimedia device to a multimedia controller. LAN for 4 to communicate digital data in drawing 7 and 1 are multimedia controllers which control system-wide actuation. 2 generalizes the structure of the multimedia device connected to LAN4. 205 is a system director object which is a software object (it abbreviates to an object henceforth) which resides in the multimedia controller 1 permanently

and manages the whole system.

[0036] 1064 is a multimedia device object which is an object which functions as an object-ized multimedia device for other objects on LAN4. The multimedia device object 1064 consists of three more objects 1065, 1066, and 1067.

[0037] In order that 1065 may realize the function of most multimedia devices 2, the multimedia device controller object which controls hardware, the multimedia device data input object which takes charge of the input 1066 minded LAN4 of the digital data from other devices, and 1067 are multimedia device data output objects which take charge of the output through LAN4 of the digital data to other devices.

[0038] When 1061 connects the multimedia device 2 to the multimedia controller 1 through LAN4, it is a multimedia device substitute object description file which describes the specification of the multimedia device substitute object generated in the multimedia controller 1. The multimedia device substitute object description file 1061 consists of the data I/O substitute object description sections 1063 which describe the specification of the data I/O substitute object to the multimedia device control panel object description section 1062 and the multimedia device 2 which describe the specification of the control panel of the

multimedia device 2 which acts for data I/O. Especially the multimedia device

control panel object description section has realized the function of the GUI

description language which describes the control panel for operating the

multimedia device 2 by GUI.

[0039] Drawing 8 is drawing explaining a condition when the multimedia device 2

is connected to LAN4. In drawing 8 , 1068 is an object generated in the

multimedia controller 1, and is the multimedia device substitute object 1068

which functions as a substitute of the multimedia device 2 in the multimedia

controller 1. The multimedia device substitute object 1068 consists of a

multimedia device control panel object 1069 which functions as a control panel

of the multimedia device 2, a multimedia device data input substitute object 1070

which functions as a substitute of the multimedia device data input object 1066

in the case of a data input, and a multimedia device data output substitute object

1071 which functions as a substitute of the multimedia device data output object

1067 similarly.

[0040] Drawing 9 is drawing showing the configuration of a general class library.

In drawing 9 , 1079 is the 1st class which is one of the classes which define a

property and a function common to an object with the same property, and

function as a template for object generation. Calling what united p classes from the 1st class 1079 to the p-th class 1085 as a library a class library 1086, all objects belong to a specific class. In order that the class definition part which defines the data type of an internal variable in which the object belonging to a class has 1080, a name, and the data type and the name of the inner function (a class method is generally called) showing a data-processing means, and 1081 may enable access of a class method, the class method table which table-ized the pointer to each code of a class method, and 1082 are code sections which store the function code of k class methods from the 1st function code 1083 to the k-th function code 1084.

[0041] Drawing 10 is drawing having shown the structure of a general object. In drawing 10 , 234 is an object and is constituted by the pointer storing section 244 to a class method table, the messaging means 245, the processing retrieval means 246, the method section 239, and the internal data division 235. The method section 239 consists of m data-processing means to the m-th data-processing means 242 including the 1st data-processing means 240 and the 2nd data-processing means 241. 235 is internal data division and consists of n in-house datas to the n-th in-house data 238 including the 1st in-house data

236 and the 2nd in-house data 237.

[0042] Since it is sharable between objects if the data-processing means which

the method section has has the the same class, although it has in the interior of

an object, since each in-house data which constitutes the internal data division

235 is peculiar to each object, the data-processing means from the 1st

data-processing means 240 to the m-th data-processing means 242 is managed

for every class on the class method table 243, and is shared from two or more

objects belonging to the same class. The class method table 243 is referred from

each object by the pointer stored in the pointer storing section 244 to a class

method table.

[0043] The messaging means 245 sends the message from other objects to the

reception processing retrieval means 246. the processing retrieval means 246

analyzes this message, carries out method section 239 (actual -- from class

method table 243) retrieval of the data-processing means corresponding to this

message, and performs it. A data-processing means performs predetermined

processing to the data attached to the message, the in-house data which exists

in the internal data division 235, and external data. Although there are some

which send out a message to other objects depending on processing, this

message is sent out to other objects through the messaging means 245 in that case.

[0044] Drawing 11 is drawing showing the structure of the system director object 205. In this drawing, 1072 is the pointer storing section to a class method table, and points to the system director KURASUKURASUMESODDO table 1073. 1047 is a multimedia device substitute object generation means to generate the multimedia device substitute object 1068 based on description of the multimedia device substitute object description file 1061. A data input/output management means by which 343 manages the data I/O between objects, and 380 are application object generation means to generate the application object of the various purposes. As for a messaging means and 342, 1074 is [a processing retrieval means and 1075] the method sections. 1076 is internal data division and the link-information management data between devices at the time of Object ID and 344 making a certain actuation perform using two or more multimedia devices and 1078 are the object registration information about the connected multimedia device and the generated object.

[0045] the class to which the object which should be generated from the information which the system director object 205 read the multimedia device

substitute object description file 1061 when the multimedia device 2 was connected to LAN4 using the multimedia device substitute object generation means 1047, and was described by the multimedia device substitute object description file 1061 belongs -- choosing -- a class library -- based on the class definition part 1080 of the corresponding class, the multimedia device substitute object 1068 is generated 1081 inside.

[0046] Drawing 12 is drawing having shown the configuration of the control panel description section of a substitute object description file. In drawing 12 , 247 is the control panel object description section, and consists of i object description information from the 1st object description information 248 to the i-th object description section 249. One object description information consists of object recognition information 250, object drawing information 254, and ObjectLink information 260.

[0047] The object recognition information 250 consists of affiliation objects ID 253 which show ID of the object which the class name 251 which shows the class to which an object belongs, the object ID 252 which is ID of the i-th object proper, and the i-th object are under direct control of.

[0048] The object drawing information 254 is the information for drawing objects,

such as a carbon button which constitutes the control panel display screen 231,

and consists of j object drawing information from the 1st object drawing

information 255 to the j-th object drawing information 259. One object drawing

information consists of a drawing location and magnitude information 256, a

configuration and color information 257, and an object image 258.

[0049] The ObjectLink information 261 is description which offers a link

information with the object to which the object which constitutes a controller

object 207 grade control panel object corresponds, and consists of k ObjectLink

information from the 1st ObjectLink information 261 to the k-th ObjectLink

information 264. One ObjectLink information consists of outgoing messages 263

to the correspondence object ID 262 and a correspondence object.

[0050] Drawing 13 shows the configuration of the data I/O substitute object

description section of a substitute object description file. In drawing 13 , 650 is

the data I/O substitute object description section, 651 is the 1st input substitute

object information, and 655 is the m-th input substitute object information. Each

input substitute object information consists of adjustment file type lists 654 which

are the link place associated data input object ID 653 which shows ID of the self

object ID 652 and the data input object of a link place, and a list of file types

which can input. 659 is the 1st output substitute object information, and 663 is the n-th output substitute object information. Each output substitute object consists of adjustment file type lists 662 which are lists of the associated data output object ID which shows ID of the self object ID 660 and a corresponding data output object, and file types which can be outputted.

[0051] Next, taking the case of digital VTR, actuation of this invention is explained as an example of the control system of the concrete multimedia device 2 based on an above-mentioned system control method.

[0052] Drawing 14 is drawing showing the condition before connecting the object-ized digital VTR to a multimedia controller. In drawing 14 , it is the digital VTR object which functions as digital VTR which 203 resided in digital VTR permanently, and 206 resided in digital VTR 203 permanently, and was seen and object-ized from other devices on LAN. The digital VTR object 206 consists of three more objects. 207 is a digital VTR controller object which controls hardware of digital VTR 203.

[0053] 208 is a digital VTR data input object which takes charge of the input through LAN4 of the digital data from other devices. 209 is a digital VTR data output object which takes charge of the output through LAN4 of the digital data

to other devices. When 210 connects digital VTR 203 to the multimedia controller 1 through LAN4, it is a digital VTR substitute object description file which describes the specification of the digital VTR substitute object generated in the multimedia controller 1.

[0054] The digital VTR substitute object description file 210 consists of the digital VTR data I/O substitute object description sections 212 which describe the specification of the digital VTR data I/O substitute object to the digital VTR control panel object description section 211 and digital VTR 203 which describe the specification of the control panel of digital VTR 203 which acts for data I/O.

[0055] Drawing 15 is drawing showing the structure of the VTR controller object 207. In this drawing, 1009 is the pointer storing section to a class method table, and stores the pointer to the class method table 1018. The class method table 1018 consists of a playback activation means 1019 to control the hardware of digital VTR 203 and to perform playback actuation, and a data-processing means of image transcription activation means 1020 grade a large number which perform image transcription actuation. 1010 is a messaging means and 1011 is a processing retrieval means. Although 1012 is the method section, an actual data-processing means is shown by the class method table 1018. 1015 is

internal data division and is constituted by the variable and status information of

a large number required for control of the digital VTR 203, such as the run state

1016 of a tape, and the tape current position 1017.

[0056] First, actuation when digital VTR 203 is connected to LAN4 is explained.

Drawing 16 is drawing having shown the flow of the actuation at the time of

connecting digital VTR 203 to LAN4. Drawing 17 is drawing having shown the

screen of the multimedia controller 1. It is the icon display which shows that, as

for 228, the display of the multimedia controller 1 was connected, and, as for 229,

digital VTR 203 was connected in drawing 17 , and 230 is cursor which shows

the location which pointing devices, such as a mouse, direct. Although a pointing

device is not illustrated, the pointing device is equipped with the carbon button,

and it calls clicking the actuation to which a user pushes and turns this carbon

button generally, and calls double-clicking the actuation which clicks twice at

intervals of predetermined. In addition, as other connection devices, connection

with various devices, such as a camera (still picture input), a tuner, television,

various databases, and CD, is possible, and selection of those devices and

control can also be performed by the icon display on Screen 228.

[0057] Drawing 18 is drawing explaining a condition when the object-ized digital

VTR 203 which is the example of a multimedia device is connected to LAN4. In drawing 18 , 220 is an object generated in the multimedia controller 1, and is the digital VTR substitute object 220 which functions as a substitute of digital VTR 203 in the multimedia controller 1. The digital VTR substitute object 220 consists of a digital VTR control panel object 221 which functions as a control panel of digital VTR 203, a digital VTR data input substitute object 222 which functions as a substitute of the data input object 208 in the case of a data input, and a digital VTR data output substitute object 223 which functions as a substitute of the data output object 209 similarly.

[0058] Actuation when the object-ized digital VTR 203 which is the example of a multimedia device is connected to LAN4 according to drawing 16 , drawing 17 , and drawing 18 is explained. If digital VTR 203 is connected to LAN (636), the system director object 205 will recognize connection of digital VTR 203 (637). Next, the system director object 205 ships a device ID to digital VTR 203 (638).

[0059] Next, the system director object 205 loads the digital VTR substitute object description file 210 from digital VTR 203 using the multimedia device substitute object generation means 1047 (639). Next, the system director object 205 generates the digital VTR substitute object 220 in the multimedia controller 1

based on the digital VTR substitute object description file 210 using the

multimedia device substitute object generation means 1047 (640). It will be in

the connection condition shown by drawing 18 as a result. Next, the digital VTR

substitute object 220 displays the icon display 229 of digital VTR 203 on the

display 228 of the multimedia controller 1 (641). It waits for directions of a user

after that (642).

[0060] Henceforth, an operator can control digital VTR through the digital VTR

substitute object 220 in the multimedia controller 1 by operating digital VTR

based on the actuation screen displayed based on the digital VTR control panel

object 221 of a multimedia controller.

[0061] Next, description of the digital VTR substitute object description file 210

and the relation of the object generated are further explained to a detail.

[0062] It is drawing in which drawing 19 showed the icon of digital VTR 203, and

drawing 20 showed the example of the control panel display screen. Drawing 19

shows the icon 229 displayed in case digital VTR 203 connects with LAN4.

Drawing 20 is the default display screen which the digital VTR control panel

object 221 draws. The display selection menu of the control panel with which

232 is displayed on a display in this drawing, The 1st switch carbon button

display for the time counter display whose 265 displays the elapsed time of a

tape, and 266 to set the control mode selection section 267 which chooses the

control mode of digital VTR 203 as the default control mode, The 2nd switch

carbon button display for 268 to choose the more detailed control mode, 269 --

for a pause button display and 272, as for a fast forward button display and 274,

a playback carbon button display and 273 are [a rewind button display and 270 /

an inversion playback carbon button display and 271 / an earth-switch display

and 275] image transcription carbon button displays.

[0063] Drawing 21 is drawing explaining correspondence of the component of a

class and the digital VTR control panel object 221 with which an object belongs.

The class to which each base-component belongs is beforehand defined as the

class library 1081, and is held in the multimedia controller 1. Each component

each of the digital VTR control panel object 221 functions as an object which

constitutes the digital VTR control panel object 221 as drawing 21 shows.

[0064] In drawing 21 , the frame of the control panel display screen 231 supports

the VTR control panel object 284 (ID=1) of a panel class. The display selection

menu 232 of a control panel supports the panel view setting menu object 285

(ID=2) of a menu class. The time counter display 265 supports the time counter

object 286 (ID=3) of a form class. The rewind button display 269 supports the

rewind button object 287 (ID=4) of a carbon button class. The inversion playback

carbon button display 270 supports the inversion playback carbon button object

288 (ID=5) of a carbon button class. The pause button display 271 supports the

pause button object 289 (ID=6) of a carbon button class. The playback carbon

button display 272 supports the playback carbon button object 290 (ID=7) of a

carbon button class. The fast forward button display 273 supports the fast

forward button object 291 (ID=8) of a carbon button class. The earth-switch

object 292 (ID=9) of a carbon button class and the image transcription carbon

button display 275 support [the earth-switch display 274] the image

transcription carbon button object 293 (ID=10) of a carbon button class.

[0065] The control mode selection section 266 supports the control mode

change object 294 (ID=11) of a carbon button group class. The 1st switch

carbon button 267 supports the default carbon button object 295 (ID=12) of a

radio button class. The 2nd switch carbon button 268 supports the upper carbon

button object 296 (ID=13) of a radio button class.

[0066] Next, generation of the playback carbon button object playback carbon

button object 290 is explained as an example among the objects which

constitute the digital VTR control panel object 221 shown in drawing 21 .

[0067] Drawing 22 is an explanatory view about generation of the playback

carbon button object 290. In drawing 22 , 297, 298, 299, 300, 601, 602, 603, 604,

605, 606, 607, 608, 609, 610, and 611 show the element described by the object

control panel object description section 247 of the digital VTR substitute object

description file 210.

[0068] 297 is object recognition information and consists of a class name 298,

an object ID 299, and an affiliation object ID 300. 601 is the 1st object drawing

information and consists of a drawing location and magnitude information 602, a

configuration and color information 603, and an object image 604. 605 is the 2nd

object drawing information and consists of a drawing location and magnitude

information 606, a configuration and color information 607, and an object image

608. 609 is the ObjectLink information and consists of a link place object ID 610

and an outgoing message 611.

[0069] 290 is a carbon button object playback carbon button object generated

from the information on the object control panel object description section 247 of

a class and the digital VTR substitute object description file 210. 613 is the

pointer storing section to a class method table, and stores the pointer which

points at the carbon button KURASUKURASU method table 625. A carbon

button initialization means 626 to initialize the internal variable of a carbon button

object in case the object of a carbon button class is generated, a carbon button

drawing means 627 to draw the display of a carbon button object, and a user a

carbon button KURASUKURASU method table the drawing location of a carbon

button object When it directs with the cursor 230 of pointing devices, such as a

mouse, and click actuation is performed, while it is shown by changing the

display of a carbon button temporarily etc. that the carbon button object was

clicked in response to the actuation It consists of click reaction means to send

out a message to other objects.

[0070] It is indicated by the class, and from all the objects not only belonging to

the playback carbon button object 290 but other carbon button classes, the

definition of each data-processing means which these carbon button class

method tables hold is referred to in common, and it has it and it is required. 614

is a messaging means and 615 is a processing retrieval means. 616 is the

method section and 620 is internal data division. The internal data division 620

consist of an object ID 621, carbon button condition data 622, a drawing

parameter 623, and link data 624. The internal data type which all the carbon

button objects not only belonging to the playback carbon button object 290 but a carbon button class should have is indicated by the class.

[0071] Although the system director object 205 reads the digital VTR substitute object description file 210 and each object is generated, in the example of drawing 22 , description of the class name 298 of the object recognition information 297 generates the object of a carbon button class. In case the system director object 205 generates the playback carbon button object 290, initialization of the internal data division 620 is performed by the carbon button initialization means 626. According to the example of drawing 22 , Object ID is set as ID=7 by description of an object ID 299. As for the system director object 205, description of the affiliation object ID 300 shows that the playback carbon button object 290 belongs to the digital VTR control panel object 221. Based on the affiliation object information on such each object, the system director object 205 gets to know the inclusion relation between objects, and generates the object which consists of two or more objects as a compound object.

[0072] The carbon button drawing means 627 draws the playback carbon button object 290 based on the drawing parameter 623 and the carbon button condition data 622. The carbon button drawing means 627 is automatically performed at a

carbon button object generate time and the time of migration of an affiliation

object.

[0073] The 1st object drawing information 601 has described the drawing

information 625 on the carbon button when not being pushed. The rectangle

frame information which shows the drawing location and magnitude in the digital

VTR control panel object 221 at the time of a drawing location and the

magnitude information 602 drawing the playback carbon button object 290 is

described. This rectangle frame information is expressed by the coordinate of

the upper left and the lower right as the coordinate information which specifies

this rectangle information in the system of coordinates of the digital VTR control

panel object 221 like (X1, Y1) of the drawing information 625 on the carbon

button when not being pushed, and (X2, Y2), and an example. Drawing of the

playback carbon button object when not being pushed is performed based on a

configuration and the color information 603, or the object image 604. A

configuration and the color information 603 are described in the language for

drawing objects, such as how applying the calligraphy color of a line. The object

image 604 is expressed by bit map data. Although the amount of data has little

way generally expressed by the former and it ends, latter one has a high degree

of freedom.

[0074] The 2nd object drawing information 605 has described the drawing

information 626 on the carbon button when being pushed by the same approach

as the 1st object drawing information 601. The drawing parameter 623 is

determined based on the 1st object drawing information 601 and the 2nd object

drawing information 605. Although the link data 624 are set up based on the

ObjectLink information 609, 'play' is set up as an outgoing message and the link

place object ID is set up as a link place object ID, it is the purpose by which the

object of the receipt point is determined as a meaning by the whole system in

case a message is sent out, and when digital VTR 203 is connected to LAN4,

the system director object 205 is set up in the form which added the device ID

assigned to digital VTR to the link place object ID.

[0075] Therefore, even if it uses ID which the object overlapped between devices,

it becomes possible to tell a message correctly. Carbon button condition data

hold the condition of whether the carbon button is pushed.

[0076] Drawing 23 is drawing having shown the flow chart of the actuation at the

time of operating a showing [the actuation at the time of a user doubling and

double-clicking cursor 230 to the icon display 229 of digital VTR 203] flow chart,

and a control panel.

[0077] Drawing 24 is drawing showing the display screen of the multimedia

controller 1 at the time of a user double-clicking the icon display 229 of digital

VTR 203. In drawing 24 , 231 is the default control panel display screen of digital

VTR 203, and 272 is a playback carbon button.

[0078] Drawing 29 is drawing having shown the structure of the digital VTR

control panel object of a panel class, and the relation of object description

information.

[0079] In drawing 29 , 1401 is the pointer storing section to a class method table,

and shows the panel KURASUKURASU method table 1402. A panel

KURASUKURASU method table consists of click reaction means 1405 which

show actuation when a panel initialization means 1403 to initialize a panel object,

a panel drawing means 1404 to draw a panel, and a panel are double-clicked.

As for a messaging means and 1407, 1406 is [a processing retrieval means and

1410] internal data divisions, and, as for Object ID and 1412, 1411 is [panel

condition data and 1413] drawing parameters. Although the internal data

division 1410 are initialized according to description of the digital VTR substitute

object description file 210, the digital VTR control panel object description

section 211 of the digital VTR substitute object description file 210 consists of

the object recognition information 1414, the 1st object drawing information which

shows the icon image 1426 of digital VTR 203, and the 2nd object drawing

information 1422 which shows the frame 1427 of the control panel of digital VTR.

The object recognition information 1414 consists of a class name 1415 (panel

class), an object ID 1416 (ID=1), and an affiliation object ID. The 1st object

drawing information 1418 consists of a drawing location and magnitude

information 1419, a configuration and color information 1420, and an object

image 1421. The 2nd object image 1422 consists of a drawing location and

magnitude information 1423, a configuration and color information 1424, and an

object image 1425.

[0080] According to drawing 23 and drawing 29 , the directions approach of the

control panel display action of digital VTR 203 and playback actuation is

explained. Although the digital VTR substitute object 220 displays the icon

display 229 based on the icon image 1426 when the system director object 205

generates the digital VTR substitute object 220 in the actuation explained by

drawing 16 If a user directs and double-clicks the icon 229 of digital VTR with

cursor 230 (643) The control panel object 221 of the digital VTR substitute object

220 sends out the message which directs drawing to all the objects that

constitute the control panel object 221 so much. All the objects shown in <u>drawing</u>

<u>21</u> according to this message perform a drawing means, and a control panel

object draws the frame of the control panel of digital VTR based on the 2nd

object drawing information in that case. Consequently, the digital VTR control

panel display 231 for operating digital VTR 203 is displayed like <u>drawing 24</u>

(644), and waits for directions of a user (645). If a user directs and clicks the

playback carbon button 272 of this control panel 231 with cursor 230 in this

condition (646), the control panel object 221 sends out message'PLAY' to the

controller object 214 of digital VTR 203 (647). Therefore, the controller object

214 of digital VTR 203 starts a playback activation means in response to this

message to this (648). Playback actuation of digital VTR 203 is started by

starting of a playback activation means.

[0081] A multimedia device substitute object required for actuation of a

multimedia device only by connecting a multimedia device to a multimedia

controller through LAN according to this invention, as explained above is

automatically generated by the multimedia controller. A control panel still more

nearly required for actuation of a multimedia device is automatically displayed on

the display of a multimedia controller. If a user operates it to this control panel,

the suitable message for the controller object of a multimedia device is sent out,

and a request can be operated. In order to acquire information required in order

to generate a multimedia device substitute object required for actuation of a

multimedia device from the multimedia device substitute object description file

read from the multimedia device, it does not need to have the information about

a specific multimedia device in a multimedia controller beforehand that there

should just be a fundamental class library.

[0082] Drawing 25 is drawing having shown the structure of a digital VTR data

input substitute object, and the relation of object description information. In

drawing 25 , 222 is a digital VTR data input substitute object, 668 is the pointer

storing section to a class method table, and the data input substitute class class

method table 679 is shown. The data input substitute class class method table

679 consists of a data input substitute object initialization means 680, a renewal

means 681 of a link information, and an adjustment file type answerback means

678.

[0083] As for a messaging means and 670, 669 is [a processing retrieval means

and 671] the method sections. 674 is internal data division and 675 is the

associated data input object ID which is ID of the data input object to which

Object ID and 676 correspond. The adjustment file type which shows the file

type of the data which 677 can input, and 1006 are link informations with a data

output object.

[0084] Although a digital VTR data input substitute object is generated based on

the digital VTR data I/O substitute object description section 212 of the digital

VTR substitute object description file 210 682 is the input substitute object

information described by the digital VTR data I/O substitute object description

section 212. It consists of an object (this example ID= 1) ID 683, an associated

data input object (this example ID= 1) ID 684, and an adjustment file type list 685

(in this example, it considers as the format called AV1 and AV2). The input

substitute object initialization means 680 initializes the data of the internal data

division 674 by these description.

[0085] Drawing 26 is drawing having shown the structure of a digital VTR data

output substitute object, and the relation of object description information. In

drawing 26 , 223 is a digital VTR data output substitute object, 690 is the pointer

storing section to a class method table, and the data output substitute class

class method table 1048 is shown. The data output substitute class class

method table 1048 consists of a data output substitute object initialization means 694, a renewal means 695 of a link information, and an adjustment file type answerback means 700.

[0086] As for a messaging means and 692, 691 is [a processing retrieval means and 693] the method sections. 696 is internal data division and 697 is the associated data output object ID which is ID of the data output object to which Object ID and 698 correspond. The adjustment file type which shows the file type of the data which 699 can output, and 688 are link informations with a data output object.

[0087] Although a digital VTR data output substitute object is generated based on the digital VTR data I/O substitute object description section 212 of the digital VTR substitute object description file 210 1001 is the data output substitute object information described by the digital VTR data I/O substitute object description section 212. It consists of an object (this example ID= 1) ID 1002, an associated data output object (this example ID= 1) ID 1003, and an adjustment file type list 1004 (in this example, it considers as the format called AV1 and AV2). The data output substitute object initialization means 694 initializes the data of the internal data division 696 by these description.

[0088] Drawing 27 is drawing having shown the structure of a digital VTR data input object. In drawing 22 , 208 is a digital VTR data input object, 1022 is the pointer storing section to a class method table, and the data input class class method table 1031 is shown. The data input class class method table 1031 consists of a file write-in means 1032, a data receiving means 1033, and a renewal means 686 of a link information. As for a messaging means and 1024, 1023 is [a processing retrieval means and 1025] the method sections. 1028 is internal data division, 1029 is Object ID and 1030 is a link information.

[0089] Drawing 28 is drawing having shown the structure of a digital VTR data output object. In drawing 28 , 209 is a digital VTR data output object, 1035 is the pointer storing section to a class method table, and the data output class class method table 1044 is shown. The data output class class method table 1044 consists of a file readout means 1045, a data transmitting means 1046, and a renewal means 687 of a link information. Moreover, as for a messaging means and 1037, 1036 is [a processing retrieval means and 1038] the method sections. 1041 is internal data division, 1042 is Object ID and 1043 is a link information.

[0090] It functions as if it was the digital VTR data input object 208 and the digital VTR data output object 209, when the data input substitute object 222 and the

data output substitute object 223 of digital VTR 203 were generated in a multimedia controller. For example, when copying the file of other multimedia devices to digital VTR, the system director object 205 asks the type of a file which can be inputted into the digital VTR data input substitute object 222. The adjustment file type answerback means of the digital VTR data input substitute object 222 answers the file type which digital VTR 203 can receive to an inquiry of the system director object 205.

[0091] The link from the output substitute object to the digital VTR data input substitute object 222 of a multimedia device which has the file which it is going to copy if the file type of the file which it is going to copy exists in it is set up. The renewal means 681 of a link information of the digital VTR data input substitute object 222 sends a message to the digital VTR data input object 208, starts the renewal means of a link of the digital VTR data input object 208, and updates the link information 688 of the digital VTR data input object 208.

[0092] The link of the data output object of a multimedia device which has the file which it is going to copy by sending out the message in which the data output substitute object of a multimedia device which has the file which it is going to copy to coincidence updates the link information of a data output object, and a

link information being updated, and the digital VTR data input object 208 is set

up.

[0093] Then, the data transmitting means of the data output object of a

multimedia device which has the file which it is going to copy is started, and the

copy of a file is performed because the data output object of a multimedia device

which has the file which it is going to copy starts delivery, the data receiving

means 1033, and the file write-in means 1032 for a message to a DEJITA VTR

data input object. That is, if directions of a copy etc. are directed to the data input

substitute object and data output substitute object in a multimedia controller, a

data input substitute object and a data output substitute object send out a

message to the data input object and data output object of the body of a

multimedia device, respectively, and in order to set up the link of the data

between multimedia devices, a multimedia controller does not need to involve

directly about an actual copy of data etc.

[0094] As mentioned above, in case the whole system to which two or more

multimedia devices were connected is controlled according to the

above-mentioned example It becomes unnecessary to install and prepare a

device driver, application software, etc. for performing the control beforehand for

a controller side like former. A control panel and a device condition are automatically displayed on the screen of a controller only by connecting a multimedia device on LAN, and there is big effectiveness, such as becoming easy to perform the change of control and I/O of the ON/OFF and the body of a power source in a screen.

[0095] Moreover, it is possible to unify the user interface with which a multimedia device can exchange by liking of a user, and differs from the components group which it had beforehand, and which is defined identically for every manufacturer by the controller side in the components group of the control panel sent to the controller side. Furthermore, control from the controller of a remote place and access of a multimedia device can be performed now transparent through LAN.

[0096] Drawing 30 is drawing having shown the structure of the panel view setting menu object of a menu class, and the relation of object description information.

[0097] In drawing 30 , 1428 is the pointer storing section to a class method table, and shows the menu KURASUKURASU method table 1430. A menu KURASUKURASU method table consists of menu selection reaction means 1433 which show actuation when a menu initialization means 1431 to initialize a

menu object, a menu drawing means 1432 to draw a menu, and a menu are

chosen. For 1429, as for a processing retrieval means and 1435, a messaging

means and 1434 are [the method section and 1436] internal data divisions, and,

as for Object ID and 1438, 1437 is [menu condition data and 1439] drawing

parameters. Although the internal data division 1436 are initialized according to

description of the digital VTR substitute object description file 210 The

description section about the panel view setting menu of the digital VTR control

panel object description section 211 of the digital VTR substitute object

description file 210 The 2nd menu item of the object recognition information

1440, the 1st object drawing information 1444 which shows the title of a panel

view setting menu, the 2nd object drawing information 1448 which shows the 1st

menu item of a panel view setting menu, and a panel view setting menu It

consists of the shown 3rd object drawing information 1452. The object

recognition information 1440 consists of a class name 1441 (this example menu

class), an object ID 1442 (this example ID= 2), and an affiliation object ID (this

example ID= digital VTR control panel of 1). The 1st object drawing information

1444 consists of a drawing location and magnitude information 1445, a

configuration and color information 1446, and an object image 1447, and

expresses a menu title 1462. The 2nd object drawing information 1448 consists

of a drawing location and magnitude information 1449, a configuration and color

information 1450, and an object image 1451, and shows the 1st menu item 1463.

The 3rd object drawing information 1452 consists of a drawing location and

magnitude information 1453, a configuration and color information 1454, and an

object image 1455, and shows the 2nd menu item 1464. The 1st ObjectLink

information 1456 has described the sending-out place of a message and a

message published when the 1st menu item 1463 is chosen, the link place

object ID 1457 shows ID of a system director object, and an outgoing message

1458 shows the message 'Create object with file "Default"'. The 2nd ObjectLink

information 1459 has described the sending-out place of a message and a

message published when the 2nd menu item 1464 is chosen, the link place

object ID 1460 shows ID of a system director object, and an outgoing message

1461 shows the message 'Create object with file"Custom1"'.

[0098] Drawing 31 is drawing explaining having the function which chooses one

file from multiple files, in case the system director object 205 reads a multimedia

device substitute object description file. drawing 31 -- setting -- 1465 -- "Default"

** -- the digital VTR substitute object description file of the name to say -- it is --

1466 -- "Custom1" ** -- it is the digital VTR substitute object description file of the name to say.

[0099] Drawing showing how a user changes a control panel a , as for drawing 32 , and drawing 33 are drawings showing the screen after a change.

[0100] as being shown in drawing 32 -- a default -- the system director object 205 -- "Default" ** -- in order to read the digital VTR substitute object description file 1465 of the name to say and to generate the digital VTR control panel object 221, while the default digital VTR control panel display screen 231 is displayed -- the panel view setting menu 232 -- 'Default' It is set up. a user -- the cursor 230 of a pointing device -- the panel view setting menu 232 -- 'Custom1' if it chooses -- the panel view setting menu object 285 -- the menu selection reaction means 1433 -- the system director object 205 -- 'Create object with file"Custom1"' ** -- the message to say is sent out. Although the system director object 205 once discards the digital VTR substitute object 220 with the multimedia device substitute object generation means 1047 in response to this message and regeneration is carried out, it is "Custom1" in that case. The digital VTR substitute object description file 1466 of the name to say is read, and regeneration of the digital VTR control panel object 221 is carried out by this file.

"Custom1" ** -- by describing the control panel of appearance which is different in the digital VTR substitute object description file 1465 of the name Default", in the digital VTR substitute object description file 1466 of the name to say, the control panel display screen 233 of the 2nd appearance can be displayed like drawing 33 .

[0101] Although round the angle of a frame, it carries out for being able to smell a carbon button display and attaching or the English display is changed into the Japanese display in the example of drawing 33 , according to this invention, replying to a demand of various users is possible by preparing various substitute object description files.

[0102] Drawing 34 is drawing having shown the example which changed arrangement of a manual operation button by this invention. Although it was not restricting to a multimedia device, generally, arrangement of the manual operation button of an electric product changed with manufacturers, and when severe, the same manufacturer also changed with products. This thing was confusing the user. When it had got used to one equipment for years and new equipment was bought, actuation needed to be rememorized again. According to this invention, arrangement of a manual operation button can be easily

changed by modification of a substitute object description file, and a user can be made to choose it from two or more arrangement.

[0103] A user changes arrangement of a manual operation button by still more interactive actuation, and if application software which makes the result reflect in a substitute object description file is supplied, it will also enable a user to customize a control panel freely according to liking. Moreover, when the firm which supplies the multimedia controller 1, for example, or the 3rd person supplies the substitute object description file of various multimedia devices, it also enables A company to unify arrangement of the manual operation button of drawing 34 (a) and the multimedia device like drawing 34 (b) with B various companies by the plan of the firm which supplies the multimedia controller 1, or the 3rd person.

[0104] Advanced features of a multimedia device also become the cause of confusing a user. That is, or a user does not usually use, even the operating member for the function in which a user's knowledge level cannot be used being low is displayed on a control panel, and there is that it is hard a user coming to use plentifully. This invention can be used also in order to display a required operating member if needed for a user.

[0105] Drawing 35 is the control panel display screen of the digital VTR which has an advanced function. A slider for a control panel display screen for 276 to operate a function including an additional function in drawing 35 , and 277 and 280 to adjust an audio recording level by the manual, and 278 and 279 are the level meters for supervising a recording level. A carbon button group for 281 to set up the compress mode of an image, the compress mode setup key of a default [282], and 283 are the compress mode setup keys by MPEG (dynamic-image compression method of international standards). For the user who does not need high efficiency, these operating members only cause derangement.

[0106] The control panel display screen 276 for operating a function including the control panel display screen 231 and the additional function for operating only a necessary minimum function by the control mode change object 294 of drawing 21 can be changed. That is, if a user chooses the upper carbon button 296 of ** 35th Fig. illustration with a pointing device, the system director object 205 will carry out regeneration of the control panel object for operating the function which reads the digital VTR control panel substitute object description file which described the control panel display screen 276 for operating a function

including an additional function, and includes an additional function. If an additional function becomes unnecessary, and a user chooses the default carbon button 296 of ** 35th Fig. illustration with a pointing device similarly, the system director object 205 will carry out regeneration of the control panel object for reading the digital VTR control panel substitute object description file which described the control panel display screen 231 for operating a minimum function, and operating a minimum function.

[0107] Although two or more multimedia device substitute object description files were used in the old example in order to choose two or more GUI, it is also possible to describe two or more GUI in the multimedia device control panel object description section of one multimedia device substitute object description file.

[0108]

[Effect of the Invention] As mentioned above, in case the whole system to which two or more multimedia devices were connected is controlled according to this invention It becomes unnecessary to install and prepare a device driver, application software, etc. for performing the control beforehand for a controller side like former. A control panel and a device condition are automatically

displayed on the screen of a controller only by connecting a multimedia device

on LAN, and the change of control and I/O of the ON/OFF and the body of a

power source etc. can be performed.

[0109] Moreover, according to liking of it being not only possible to unify a user

interface which is different for every manufacturer by choosing it as a control

panel generate time from two or more GUI description but a user, selection and

editing further are also possible in GUI. Furthermore, it becomes easy to carry

out actuation by displaying only a required operating member according to

actuation of a user.

[Translation done.]

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the logical topology of a multimedia controller and a multimedia device.

[Drawing 2] It is drawing showing the physical-connection gestalt of a multimedia controller and a multimedia device.

[Drawing 3] It is drawing showing the internal structure of the object-ized multimedia device.

[Drawing 4] It is drawing showing the internal structure of the object-ized multimedia controller.

[Drawing 5] It is the system-hierarchy Fig. of a multimedia controller.

[Drawing 6] It is the system-hierarchy Fig. of a multimedia device.

[Drawing 7] It is drawing showing the condition before connecting a multimedia device to a multimedia controller.

[Drawing 8] It is drawing showing a condition when a multimedia device is

connected to LAN.

[Drawing 9] It is drawing showing the configuration of a general class library.

[Drawing 10] It is drawing showing the structure of an object.

[Drawing 11] It is drawing showing the structure of a system director object.

[Drawing 12] It is drawing showing the configuration of the control panel

description section of a substitute object description file.

[Drawing 13] It is drawing showing the configuration of the data I/O object

description section of a substitute object description file.

[Drawing 14] It is drawing showing the condition before connecting the

object-ized digital VTR to a multimedia controller.

[Drawing 15] It is drawing showing the structure of a VTR controller object.

[Drawing 16] It is the flow chart of the actuation at the time of connecting digital

VTR to LAN.

[Drawing 17] It is drawing showing the screen of a multimedia controller.

[Drawing 18] It is drawing showing a condition when the digital VTR object-ized

as a multimedia device is connected to LAN.

[Drawing 19] It is drawing showing the icon of digital VTR.

[Drawing 20] It is drawing showing the control panel display screen.

[Drawing 21] It is drawing explaining correspondence of the component of a class and a digital VTR control panel object with which an object belongs.

[Drawing 22] It is an explanatory view about generation of a playback carbon button object.

[Drawing 23] It is the flow chart of the actuation at the time of doubling cursor and choosing control as the icon display of digital VTR.

[Drawing 24] It is drawing showing the display screen of the multimedia controller at the time of an operator choosing control from the icon display of digital VTR.

[Drawing 25] It is drawing having shown the structure of a digital VTR data input substitute object, and the relation of object description information.

[Drawing 26] It is drawing having shown the structure of a digital VTR data output substitute object, and the relation of object description information.

[Drawing 27] It is drawing showing the structure of a digital VTR data input object.

[Drawing 28] It is drawing showing the structure of a digital VTR data output object.

[Drawing 29] It is drawing having shown the structure of the digital VTR control panel object of a panel class, and the relation of object description information.

[Drawing 30] It is drawing having shown the structure of the panel viewing

setting menu object of a menu class, and the relation of object description

information.

[Drawing 31] In case a system director object reads a multimedia device

substitute object description file, it is drawing for explaining the function which

chooses one file from multiple files.

[Drawing 32] It is drawing showing how to change a control panel.

[Drawing 33] It is drawing showing the screen after changing a control panel.

[Drawing 34] It is drawing showing the example at the time of changing

arrangement of a manual operation button.

[Drawing 35] It is drawing showing the control panel display screen of digital

VTR.

[Translation done.]